MINUTES OF THE PROCEEDINGS

METEOROLOGICAL OFFICE
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METEOROLOGICAL COUNCIL

1904–1905.

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1904–1905.

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Office

MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL.

1904–1905.

63, *Victoria Street, S.W., 6th April*, 1904.

PRESENT:

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

923. The Minutes (908-922) of the last meeting (23rd March) were read and confirmed.

924. *Rainfall Tables.*—In pursuance of Minute 910, the Secretary reported that the number of stations on the list of the 1897 publication for which information respecting the 10 years 1891–1900 was available in the Office was 74, and the cost of the publication, if carried out on the scale indicated in Dr. Mill's letter (Minute 910), would certainly be not less than and would probably exceed Dr. Mill's estimates by about £37 10*s.*; and further, that the cash book figures for 1903–1904 showed a balance of £1,489 at the end of the year as compared with £1,776 at the beginning; that he had no reason to think that the correction of the balance by the usual estimate of liabilities and assets would seriously modify the relation of the expenditure and income for the year; and that, apart from any diminution of balance due to the continued charge for Fort William at the request of the First Lord of the Treasury (Minute 406), it appeared that the current expenditure of the Office on the same scale as that of the past year would absorb all the regular income; that the suggested expenditure on the publication of the Rainfall Tables could be met out of the remaining balance of £1,489, but not from any other source.

It was resolved that an agreement with Dr. Mill, in pursuance of Minute 910, be prepared.

925. *Annual Report.*—The Secretary was directed to prepare a draft report for the year ended 31st March, 1904, upon the same lines as that for last year, and was authorised to modify the Appendix, giving the list of additions to the library, in such a way as to group the official publications of various kinds issued by the Colonies, Dependencies, and Foreign Countries.

926. *Office Staff* (1).—It was resolved to continue the appointments of Miss E. C. Humphreys (Minute 645), Miss M. E. Clowes (Minute 692 (3)), and Mr. A. T. Bench (Minute 668 (2)).

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926. *Office Staff* (2) *Increments of Salary.*—The following increments to the Office Staff were allowed (Minute 635 (3)) from 1st April, 1904 :—

—	Salary in 1903–4.	Proposed for 1904–5.
	YEARLY.	
CLASS I.—MAXIMUM £275–£300 :—	£ s. d.	£ s. d.
C. Harding (Minute 610 (1))	280 0 0	285 0 0
R. H. Curtis	290 0 0	295 0 0
F. J. Brodie	235 0 0	240 0 0
H. Harries (Minute 645)...	225 0 0	230 0 0
CLASS II.—MAXIMUM £200 :—		
R. Sargeant	185 0 0	190 0 0
C. H. Thompson (Minute 668)	175 0 0	180 0 0
CLASS III.—MAXIMUM £150 :—		
R. F. Wallace	140 0 0	145 0 0
A. R. Simpkins	135 0 0	140 0 0
F. W. Snell...	130 0 0	135 0 0
A. H. Bell (Minute 668)...	125 0 0	130 0 0
CLASS IV.—MAXIMUM £110 :—		
J. T. Williams	95 0 0	100 0 0
A. T. Bench (Minute 668 (2))	75 0 0	80 0 0
FEMALE CLERKS.—MAXIMUM £75 :—		
E. C. Humphreys (Minute 645)	50 0 0	55 0 0
M. E. Clowes (Minute 592 (3))	50 0 0	55 0 0
	WEEKLY.	
BOY CLERKS.—MAXIMUM £1 :—		
W. Hayes	0 17 0	0 18 6
H. E. Carter	0 15 6	0 17 0
W. Tomkins	0 12 6	0 14 0
L. Tarrant	0 12 6	0 14 0
H. Keeton (Minute 765)	0 14 0	0 15 6

—— —— (3) *Forecast District Inquiry* (Minutes 597, 679, 832, 902).—The consideration of the continuance of the allowance at the disposal of the Secretary (Minute 597) for the inquiry into the climatological data of the forecast districts was deferred until the proofs of the tables of Mr. Gaster's report are circulated (Minute 902).

—— —— (4) Submitted—Applications from various members of the Staff for special consideration of their position and salary ; also applications for appointment upon the Staff of the Office.

It was resolved that no further modifications of the Office arrangements involving an increase of annual payment can be made under the present Parliamentary grant.

927. *Kite Observations* (Minute 893).—Read—The following reply from the Irish Board of Agriculture and Technical Instruction :—

M.O. 759.

Department of Agriculture
and Technical Instruction for Ireland,
Upper Merrion Street, Dublin,
23rd March, 1904.

SIR,

WITH reference to your letter of the 3rd inst., received in these offices on the 11th inst., relative to the proposal to obtain meteorological observations from time to time by means of kites flown from the deck of the s.s. "Helga," I am desired by the Vice-President to acquaint you, for the information of the Meteorological Council, that the Department will have pleasure in granting such facilities as it may be in their power to afford for the carrying out of observations on the "Helga" in the manner suggested, provided that they are not required to incur any expense in respect of the provision or installation of the necessary apparatus.

The Department suggest that a trial should, in the first instance, be made in the Irish Sea under the supervision of experts, to be approved of by the Meteorological Office, on whatever date it may be found mutually convenient to arrange.

While deferring for the present discussion as to the duration and scope of the work to be undertaken, the Department think it well to state now that it appears improbable that arrangements could be made to conduct the experiments on the first Thursday in every month, especially if it be desired that all the investigations be made off the west coast of Ireland. It would, however, be possible to have observations made off the West Coast as regularly to date as weather might permit once every three months.

I am, &c.,
T. P. GILL,
Secretary.

The Secretary,
Meteorological Council.

The Secretary reported that he had sent copies of the letter to Captain Wilson Barker, President of the Royal Meteorological Society, and to Mr. Dines, the Chairman and Secretary respectively of the Committees concerned with the experiments.

Approved.

928. *Publications: Climatological Observations in Tropical Africa.*—The Secretary reported that the printing of the volume was nearly complete, and that the proofs were being sent to Mr. Ravenstein for final correction after being read against the MS. in the Office.

Approved.

929. —— *Presentation Copies.*—Read—M.O. 821 from the Reale Instituto d'incorraggiamento di Napoli asking for copies of current and past publications of the Office.

The Secretary was directed to express the regret of the Council at their inability to comply with the request.

930. *Stations:* (1) *Ocean Island* (Minute 878).—The question of adding a sunshine recorder to the equipment of the Ocean Island Station was postponed until there was opportunity of seeing how the arrangements already sanctioned worked in practice.

—— (2) Read—M.O. 848 from Mr. R. Aylmer Coates, offering observations from Monmouth Grammar School.

It was resolved to accept the observations with thanks.

931. *Board of Agriculture.*—Read—Correspondence M.O. 850 with Major Craigie, of the Board of Agriculture, respecting meteorological data for stations grouped according to the divisions adopted by the Board for agricultural purposes.

The Secretary was authorised to supply data of rainfall, temperature, and sunshine, for the divisions as suggested for 1903, and, as far as practicable, for 1879 also.

He was further authorised to consult Major Craigie as to the possibility of bringing the two systems of division of the country into congruity by subdividing the forecast districts of the Office and re-grouping the divisions for agricultural purposes.

932. *Logs.*—Seven received—one excellent, Capt. R. Pattman; also three short registers.

933. *Storm Warnings*:—

Signals hoisted on 6 days; total number of districts warned, 42.
In 20 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 19 districts by subsequent strong winds (force 7 or 6). In 3 districts they were not required.

Gales experienced without Warning.—None.

934. *Forecasts.*—The Secretary reported correspondence M.O. 690 with Ant. Jurgen's Margarinefabrieken, Oss, Holland, respecting the supply of a daily forecast of temperature in the course of which he had undertaken to send a daily forecast of maximum and minimum temperature for the next 24 hours for the Manchester District, with a note as to whether in the next following 24 hours the maximum or minimum would probably be "higher," "lower," or "similar" for a payment of 1*s.* per day in addition to the cost of the telegrams, and that it was proposed to commence the service at the end of the summer.

Also, by way of testing the efficiency of such forecasts, he had had them prepared and checked from 24th March to 5th April with the following results :—

As a result of an application made by A. Jurgen, Margarine Factory, of Oss, Holland, who desired a forecast of the actual temperatures expected in the Manchester District, an attempt has recently been made each morning and evening to estimate the maximum and minimum temperatures for that locality for the ensuing 24 hours. The experiment shows, so far, that of the maximum temperatures forecasted, 54 per cent. were correct within 2°; in 23 per cent. of the cases the error amounted to as much as 3°, but less than 5°; and in an additional 23 per cent. the error was 5° or more than 5°. Of the minimum temperatures forecasted, 53 per cent. were correct within 2°; in 14 per cent. of the cases the error amounted to as much as 3°, but less than 5°; and in 33 per cent. the error was 5°, or more than 5°.

F. J. B.

Approved.

935. *Accounts.*—Submitted—The following statement :—

	£	s.	d.
Cash balance on 22nd March	3,995	1	6
Receipts from 23rd March to 5th April	30	12	8
	4,025	14	2
Cheques drawn from 23rd March to 5th April ...	2,591	4	0
Cash balance on 5th April	£1,434	10	2

936. *Reports of Work* for March were submitted and approved.

937. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 20th April*, 1904.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

938. The Minutes (923–937) of the last meeting, 6th April, were read and confirmed and a revise of the minutes of the meeting of 9th March, with an appendix to Minute 902 giving the diagrams of climatological data for England, N.W., was submitted and approved.

939. *Royal Meteorological Society: Kite Observations.*—Reported—The receipt of a letter (M.O. 988) from the Royal Society intimating that the Admiralty had approved of H.M.S. "Seahorse" being lent for the purpose of meteorological observations with kites, and asking that Mr. Shaw should communicate directly with the Commander-in-Chief at Portsmouth with regard to details.

The Secretary reported that he had written to the Commander-in-Chief (P.C. 1,240) and had advised Mr. Dines of the purport of the communication.

Approved.

940. *Anemometer Stations: Alnwick.*—Read—The following letter: —

M.O. 890.

Albury Park,
Guildford,
8th April, 1904.

SIR,

ON 23rd January you kindly wrote to Mr. Kyle at Alnwick Castle with regard to the anemometer there (M.O. 172).

I have now had a report from Mr. Munro, of the King's Cross Works, from which I learn that the matter can only be satisfactorily dealt with in two ways, viz., either by retaining the Robinson anemometer and erecting a small stone tower on which the cups, standard, &c., could be fixed; or, by erecting a Dines' recorder, which would involve a tubular iron pillar 25 feet high.

I confess I am extremely reluctant to adopt either of these courses for several reasons, but mainly because of the consequent disfigurement of the building, and I am half disposed to do away with the instrument altogether. Before coming to a decision, however, I should be glad to know whether the Meteorological Office attach much importance to the record kept at Alnwick. It has often struck me that the Castle is not very well situated for the purpose, as it is on the side of a hill and at the mouth of a valley.

I am, &c.,
NORTHUMBERLAND.

The Secretary,
Meteorological Office.

The Secretary reported that he had seen Mr. Munro with regard to the repair of the existing gearing of the anemometer, and had ascertained that Mr. Munro had submitted to the Duke an estimate for its repair at a cost of £150. He also submitted a draft reply to the letter.

Approved, after amendment (P.C. 1,324).

941. —— —— *North Shields* (Minute 833 vi.).—The expenditure of £5 for the improvement of the access to the anemometer on the High Lighthouse, North Shields, by the Engineer of the Tyne Improvement Commission (M.O. 903) was approved.

942. *International Committee for Scientific Aeronautics.*—Submitted—An invitation from the Imperial Academy of Sciences of St. Petersburg, to take part in the fourth conference of the International Committee for Scientific Aeronautics to be held at St. Petersburg, 29th August to 3rd September, and a programme of the subjects of discussion.

The Secretary was directed to reply that it was doubtful if the Council would be able to send a delegate.

943. *International Telegraphic Service:* (1) *Station on South Coast of Ireland* (Minute 875).—The Secretary reported that he had made inquiry of Lloyd's and was informed (M.O. 939) that the signal station at Old Head of Kinsale was now worked by the Coastguard, and that that at Brow Head would be also worked by the Coastguard ultimately; that both had continuous attendance and were in telegraphic communication with the Post Office throughout the day and night.

It was resolved to ask the Seewarte which of the two stations they would prefer in place of Roche's Point.

(2) *Skegness* (Minute 852).—The increase of payment from 2*s.* 6*d.* to 3*s.* per week to the observer at Skegness was authorised from the completion of the first three months' reporting.

944. *Deutsche Seewarte.*—Reported—The publication of an isobaric chart of the North Atlantic for each day on the back of the "Dekadenbericht," commencing with 1st March, 1904, issued on 1st April, 1904.

945. *Publications: O.* 123 (Minute 871).—Reported—That on receipt of letters from the Stationery Office (M.O. 691) to the effect that (1) if the charts were republished the Admiralty would require 100 copies; (2) that the whole book of charts was suitable for reproduction by photo lithography;—that instructions had been given for specimen proofs to be obtained for the consideration of the Council.

Approved.

946. *Forecasts.*—Submitted—The following report on forecasts issued at 8.30 p.m. daily during the month of March, 1904 :—

The letters used have the following signification :—
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	45	71	58	91
,,	b	39	26	33	
,,	c	16	3	9	
,,	d	0	0	0	
Scotland, E.	a	35	52	44	89
,,	b	52	39	45	
,,	c	10	9	10	
,,	d	3	0	1	
England, N.E.	a	45	65	55	88
,,	b	36	29	33	
,,	c	19	3	11	
,,	d	0	3	1	
England, E.	a	45	62	54	84
,,	b	29	32	30	
,,	c	23	3	13	
,,	d	3	3	3	
Midland Counties	a	32	61	47	86
,,	b	49	29	39	
,,	c	19	7	13	
,,	d	0	3	1	
England, S.	a	55	48	52	87
,,	b	32	39	35	
,,	c	13	10	12	
,,	d	0	3	1	
Scotland, W.	a	45	81	63	86
,,	b	29	16	23	
,,	c	13	3	8	
,,	d	13	0	6	
England, N.W.	a	39	61	50	88
,,	b	39	36	38	
,,	c	19	3	11	
,,	d	3	0	1	
England, S.W.	a	45	55	50	84
,,	b	36	32	34	
,,	c	19	10	15	
,,	d	0	3	1	
Ireland, N.	a	45	71	58	84
,,	b	32	23	28	
,,	c	13	3	8	
,,	d	10	3	6	
Ireland, S.	a	39	61	50	84
,,	b	32	36	34	
,,	c	23	0	12	
,,	d	6	3	4	
Summary.					
British Islands	a	43	62	53	87
,,	b	37	31	34	
,,	c	17	5	11	
,,	d	3	2	2	

947. *Instruments: Fishery Barometer, Mullaghmore* (Minute 898).—Reported—M.O. 858 from the Chief Officer of the Coastguard, asking the Council to supply a glass case and frame as well as the barometer.

The Secretary was directed to refer in his reply to the rule that if the instrument is supplied by the Council the accessories must be supplied locally.

948. *Forecast Districts Inquiry* (Minute 902, 926 (iii.)).—Submitted—A chart exhibiting the climatological data for 10 stations in District 7 as an alternative to the diagrams shown in the appendix to Minute 902.

The form of the chart was approved, and it was resolved that the inquiry be continued on the same terms as last year (Minute 597). Attention was drawn to the desirability of reconsidering the mode of classification of the days under types of weather and to other points in connexion with the inquiry. The Secretary was requested to report further upon the matter.

949. *Logs.*—Reported—The receipt of three months' observations on form 19 (S.S.O.) from Capt. L. H. Tamplin, from the hulk "Madras," at Wuhu, Yangtse River, classed as an "excellent log"; also 10 logs, none excellent.

950. *Publications: Presentation Copies.*—Authority was given to present pilot charts for 1903 to Capt. Walker, s.s. "Toronto," to replace the set left by him on s.s. "Egyptian Prince" when he was invalided therefrom in September, 1903.

951. *Storm Warnings*:—

Signals hoisted on 5 days; total number of districts warned, 36.

In 12 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 19 districts by subsequent strong winds (force 7 or 6). In 5 districts they were not required.

Gales experienced without Warning.—None.

952. *Accounts* (i.)—The Secretary was authorised to employ the staff of the Statistical Branch at overtime to prepare a statement of rainfall data for the Mersey Docks and Harbour Board (M.O. 569), the overtime payments to be at the usual rate for Staff clerks and at 1*s.* an hour for a clerk not on the classified list.

—— (ii.)—The Secretary was authorised to continue the payments of Mr. Gaster's annuity in monthly instead of quarterly instalments (Minute 768 (3).

—— (iii). Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 5th April	1,434	10	2
Receipts from 6th to 19th April	3,692	18	1
	5,127	8	3
Cheques drawn from 6th to 19th April ...	57	11	8
Cash balance on 19th April	£5,069	16	7

953. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 4th May*, 1904.

PRESENT :

PROFESSOR DARWIN (IN THE CHAIR),

THE HYDROGRAPHER. | MR. SHAW, *Secretary*.

954. The Minutes (938–953) of the last meeting (20th April) were read and confirmed.

955. *Secretary's Special Assistant.*—It was resolved that Mr. Lempfert's appointment (Minute 635) be continued for another year from 1st May, 1904.

956. *Publications: Proposed Pilot Charts for the Indian Ocean* (Minute 873).—Read—The following letter :—

M.O. 1,022.

Simla,
6th April, 1904.

SIR,

I HAVE the honour to acknowledge your letter, M.O. 225, of 23rd February, 1904, with its accompanying map, showing trade routes and specimen of the proposed pilot charts.

2. I am extremely glad to hear that the Meteorological Council are willing to render assistance to this Department; the observations that they will be able to provide will be of very great value. It is proposed that the hour selected for the observations should be 8 a.m. by local time, as is our practice at the present in connection with the marine charts now prepared. The plan that you suggest of extracting the data from the logs as soon as they have been examined in London, and forwarding me a copy would be quite suitable.

Any other observations obtained by the method of Form 51 would also be gladly received.

3. In relation to the issue of monthly pilot charts for the Indian Ocean by the London Meteorological Office, this Department will be glad to give any help it can. It may be that a short account of our experience with such charts may be of interest.

4. When our monthly charts were started in October, 1900, circulars were sent out widely to the captains of vessels, and there was evidence that although monthly charts would be of value, an atlas containing all the 12 charts would be of greater value. At that time it was thought that a monthly discussion of the weather of the period would be useful, and a monthly issue (of which copies are sent to the Meteorological Council) was decided on. Lately, it has appeared that the difference between the chart for one month and that of the corresponding month in other years is not great enough to justify the continuation of this system, and it was decided in December last to publish an atlas which should contain 12 monthly maps, giving the normal pressure and wind (calculated up to date), the sea currents, and the storm tracks; it would also contain practical information as to the course to be adopted when the proximity of a cyclone was ascertained, and weather charts illustrating typical cyclones.

5. When I was in Calcutta a week ago, I asked the representative of the British India Steam Navigation Company to arrange for an interview with that one of their officers whose advice in such matters would be most useful. His view, which I have several times met before, was that in maps of this kind simplicity is very important; that the average wind, average sea current, and the storm tracks are all that are wanted; that sea and air temperatures are practically useless, and that magnetic information is so fully given on the regular geographical charts that there is no object in repeating it on meteorological charts. He was very strongly in favour of an atlas as compared with separate monthly charts; he also considered our size more convenient than a larger one, and liked our simple plan of treating the winds. There is no doubt that there are occasions, especially on the north side of a cyclone in the northern half of the Bay of Bengal, in which knowledge of the extent to which pressure is below normal gives much earlier indication of the existence of the cyclone than does the intensity of the wind; and hence, in spite of the view sometimes expressed that normal pressures are of little value, I am preparing the normal isobars for the charts; the bringing of these normals up to date, as far as our observations are concerned, has now been effected.

6. Under the circumstances, I think that the publication of the atlas is the right treatment of the question at issue, but I am postponing action until I hear the views of the Meteorological Council, and if they should desire to co-operate in any way, their suggestions would be gladly considered.

The most important help that could be given would be that the normals of pressure, currents, and winds given by the observations collected in London should be incorporated with our own. If the tabulation had to be performed at the expense of the Government of India, I imagine that sanction for the outlay would be difficult to obtain; unless, therefore, the normals could be given free of cost, we shall have to publish our materials alone.

7. On the whole, as regards the future, I think the best arrangement will be that if the Council prefer publishing monthly charts to preparing an atlas of the Indian Ocean extending to southern latitudes I will help them in every way I can; but the work of publication had better be theirs. Our activity will be confined to obtaining daily observations from the sources of the Council as well as our own, the drawing of a daily map and the study of the meteorological conditions thereby disclosed. If, however, the publication of an atlas of the whole area of the Indian Ocean in 10 years time were contemplated, co-operation might take place throughout, and a joint publication effected.

8. As regards the collection of information at Indian ports we now obtain yearly at Calcutta about 1,200 logs of vessels and at Bombay about 900. It has from time to time been suggested that similar work should be undertaken at Colombo and at Singapore, but the much greater expense of this plan (about Rs. 200 a month in each case instead of Rs. 80 or 90) has hitherto proved an obstacle. My impression is that we now get from Bombay and Calcutta readings from most of the ships engaged in local traffic, and that Colombo and Singapore might not give much information which could not be obtained at London or Hamburg. There will, I anticipate, be no difficulty in making arrangements for sending copies of logs collected at Bombay and Calcutta to your Office, and I shall be very glad to do anything else I can to promote the success of the monthly pilot charts if their issue is decided on.

If I have ventured to suggest some changes of method I hope that my motives may not be misunderstood. I am extremely grateful to the Meteorological Council for the kind way in which I was given the benefit of working under their Secretary a year ago.

I have, &c.,

GILBERT T. WALKER.

To the Secretary,
Meteorological Office.

Consideration postponed.

957. *Publications: Annual Summary.*—Submitted, for issue as a supplement to the Weekly Weather Report, a proof copy of an annual summary of observations at stations in the British Isles for 1903, in form similar to the monthly summary, with notes on Conspicuous Meteorological Occurrences during the year prepared for the Annual Report.

Approved.

958. —— *Presentation Copies of Annual Report for Observers.*—The following rules with regard to the issue to observers at land stations in connexion with the Office, of copies of the Annual Report of the Council, and of excerpt copies of Appendix II., were approved.

Annual Report.

Copies to be sent to the observers at—

No. in 1903.	13 Observatories.
	11 Additional anemograph stations.
	84 Normal climatological stations.
	28 Telegraphic stations, British.

Excerpt Copies of Appendix II.

Copies to be sent to observers at—

No. in 1903.	16 Additional barograph stations.
	3 Additional thermograph stations.
	87 Additional sunshine stations.
	69 Auxiliary climatological stations.
	61 Additional rainfall stations.

A circular letter of thanks for co-operation to accompany each Report and excerpt, and in the case of the latter an intimation that a full Report will be sent on application.

In some cases the observers already receive Reports in exchange for publications, &c. No second copy would be sent to them.

959. *Foreign and Colonial Stations: St. Helena* (Minute 897, v.).—Read—M.O. 1,029 from Major Paske, forwarded by the Hydrographer, postponing his report on the anemometer.

960. *Storm Warning Checking:—*

COMPARISON BETWEEN THE WARNINGS AND THE SUBSEQUENT WEATHER IN 1903.

Coasts.	Total number of Warnings.	Warnings justified by subsequent gales, Force 8 and upwards.	Warnings justified by subsequent strong winds, Forces 6 and 7.	Warnings not justified by subsequent weather.	Warnings late. Force 9 reached at two stations before issue.	Warnings partially late. Force 9 reached at one station before issue.	Warnings issued in consequence of telegraphic errors.	Storms for which no Warning was issued.
Scotland, N.E. ...	52	35	15	1	1	—	—	Oct. 5.
„ E. ...	43	16	23	4	—	—	—	
„ N.W. ...	59	37	14	5	—	3	—	
„ W. ...	58	31	19	7	—	1	—	
Ireland, S.W. ...	72	42	17	11	—	2	—	Aug. 14–15.
„ N.W. ...	70	46	14	4	1	5	—	Oct. 30.
Irish Sea	69	51	13	1	1	3	—	April 7; Oct. 30.
St. George's Channel	59	40	15	2	—	2	—	Jan. 10–11; Nov. 13.
Bristol Channel ...	58	42	13	2	—	1	—	Jan. 3–4; Aug. 14–15.
England, S.W. ...	57	33	18	6	—	—	—	
„ S.	44	27	13	4	—	—	—	
„ S.E. ...	40	29	8	2	—	1	—	
„ E.	34	17	13	4	—	—	—	
„ N.E. ...	42	28	12	2	—	—	—	
Totals	757	474	207	55	3	18	—	
Percentages ...	—	62·6	27·3	7·3	0·4	2·4	—	

GALES EXPERIENCED IN 1903 FOR WHICH NO WARNINGS WERE ISSUED.

These were few in number, and were confined to limited portions of our coasts. They occurred on the following dates, and in the following districts :—

January 3rd–4th in the Bristol Channel.—A westerly gale, caused by a depression, the centre of which moved eastwards along the north of Scotland. All the Irish and north-western coasts were duly warned, but the gale extended somewhat further south than was anticipated.

January 10th–11th in the St. George's Channel.—A N.E. gale in the rear of a depression which advanced originally in a north-easterly direction over Ireland. On reaching the Irish Sea the centre completely changed its course and moved southwards to France. The information available at 2 p.m. on the 10th was insufficient to give any definite indication of such a change, and the warnings which had been issued on the afternoon of the 8th were therefore allowed to expire. The gale sprang up on the evening of the 10th.

April 7th in the Irish Sea.—Warnings for a westerly gale were issued to the north of Scotland on the afternoon of the 6th, and were fully justified. During the ensuing night the depression which occasioned this increase of wind moved eastwards, but also extended laterally in a southerly direction, so that the gale spread to many other parts of our north and north-west coasts.

August 14th–15th over Ireland S.W. and the Bristol Channel.—A gale from S.W., veering to W. and N.W., caused by a depression the centre of which advanced north-eastwards across Ireland to the north of England, and then travelled northwards across Scotland. At 6 p.m. on the 14th, when the warnings, to be effective, should have been issued, the gradients were not steep, and were not expected to increase. The gale commenced during the ensuing night.

October 5th in Scotland N.E. (northern part only).—A depression which was approaching our western coasts on the evening of the 4th proved to be deeper than was anticipated, and caused a gale from S.E. in Caithness and the Orkneys. The western and southern coasts had all been warned on the 3rd.

October 30th in Ireland N.W. and the Irish Sea.—A depression which appeared suddenly off the north-west of Ireland on the morning of the 30th was expected to move away again over the Atlantic. The disturbance, however, continued to advance in a north-easterly direction and caused a southerly to westerly gale in the Irish Sea, and a W. to N.W. gale in the N.W. of Ireland.

November 13th in the St. George's Channel.—Owing to the appearance of a rather deep depression in the W. the signals were hoisted in Ireland and the west of Scotland on the afternoon of the 13th, and, later in the day, the warnings were extended to the Irish Sea and the north and east of Scotland. A serious increase of wind was not anticipated as far south as the St. George's Channel, but in the course of the ensuing night a strong gale from the southwards sprang up.

961. *Accounts*—Submitted—The following Statement of Accounts for the year ending 31st March, 1904 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1902–1903	—	1,776 2 5	Administration :		
Parliamentary vote ...	—	15,300 0 0	Council	826 5 0	
Repayment of expenses charged under—			Secretary	625 0 0	
(1.) Incidental expenses	12 0 6		Salaries and wages ...	1,081 14 6	
(2.) Observatories ...	28 4 9		Rent, fuel, and lighting	714 17 0	
		40 5 3	Incidental and contingent expenses ...	318 2 2	
Supply of Information :			Furniture and fittings	158 3 4	
Weather Forecasts, Reports, &c. ...	626 10 7		Expenses incidental to International Meteorological Congress...	84 17 10	
Telegrams sent abroad	583 19 6				3,808 19 10
		1,210 10 1	Special Researches :		
Supply of Instruments, &c. :			Salaries and other charges	—	842 8 1
Repayment of cost of M.O. instruments purchased by observers	158 18 5		Land Meteorology :		
Repayment of cost of other commissions...	388 13 1		Observatories and stations, including remuneration of observers	2,321 2 4	
		547 11 6	Salaries :— Discussion and reduction of observations, &c. ...	1,820 9 6	
Charges for Commission :					4,141 11 10
On supply of instruments, &c.	—	19 10 6	Weather Information and Forecasts :		
			Telegraphic reports and storm warnings, remuneration of observers, &c.	2,782 18 2	
Superannuation Account :			Salaries:—Preparation and issue of reports and forecasts ...	1,408 14 6	
Annuities	249 17 2				4,191 12 8
Interest on Investment	32 14 2		Inspections :		
		282 11 4	Salaries and travelling expenses	—	400 14 3
			Ocean Meteorology :		
			Salaries :— Discussion and reduction of observations... ...	1,366 17 6	
			Expenses incidental to the supply of instruments :—		
			Proportion of salaries for care and issue of instruments ...	165 0 0	
			Royal Navy ...	309 1 11	
			Mercantile Marine and Stations ...	479 11 7	
					2,320 11 0
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	401 8 2
			Superannuation :		
			Pensions and allowances...	829 12 8	
			Invested	750 0 0	
					1,579 12 8
			Balance :		
			Cash at Bank... ...	1,442 15 0	
			„ at Office ...	46 17 7	
					1,489 12 7
		£19,176 11 1			£19,176 11 1

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	635 12 11	By cash at Bank and at Office ...	1,489 12 7
„ balance	1,369 13 8	„ sundry debtors	515 14 0
	£2,005 6 7		£2,005 6 7

Note.—On March 31st the amount of 2½ per cent. Annuities held by the Council for the provision of superannuation annuities was £1,326 7*s.* 8*d.*

962. *Foreign and Colonial Stations: Gold Coast.*—Read—The following letter :—

M.O. 1,077.

General Manager's Office,
Sekondi, April 14th, 1904.

GENTLEMEN,

I UNDERSTAND that you supply instruments for recording weather and rain, if a person of a recognised position will undertake to supply you with the information that can be recorded from such instruments. I will gladly undertake this here if you will be so kind as to send me the necessary instruments, and if you like inland records taken I think I could get the staff of this railway to do it at Kumasi.

2. I shall be glad to hear from you.

Yours faithfully,
A. E. P. GRAVES,
General Manager.

The Meteorological Society,
London.

It was agreed to inform the Colonial Office that in this and similar cases, if the Colonial Office would make provision for the supply of instruments, the Council would arrange for the systematic publication of the results ; that Mr. Graves be informed of this suggestion, and also of the fact that observations are already received from Kumasi.

963. —— —— *East Borneo.*—The Secretary reported the receipt of a transcript of observations at 6.30 a.m. daily (with some intervals) of dry and wet bulb readings, maximum, minimum, solar-maximum, and earth-minimum temperatures of the air ; earth temperatures at 1 ft., 2 ft., 10ft., rain, together with observations of dry and wet bulb and underground temperatures at 6 p.m., at Sanga Sanga, Koetei, East Borneo, from September, 1903, to February, 1904, by Mr. J. B. H. Garrett, Geologist to Messrs. M. Samuel & Co., with the offer (M.O. 1,091) to send the observations regularly.

It was agreed to accept the offer with thanks.

964. *Logs.*—Eight received, one excellent ; one lighthouse register.

965. *Storm Warnings :—*

The signals were hoisted on 5 days, the total number of districts warned being 23.

In 6 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 12 districts by subsequent strong winds (force 7 or 6). In 5 districts they were not required.

Gales experienced without warning.—None.

966. *Accounts.*—Submitted—The following statement :—

	£	s.	d.
Cash balance on 19th April	5,069	16	7
Receipts from 20th April to 3rd May	317	12	0
	5,387	8	7
Cheques drawn from 20th April to 3rd May	1,016	12	7
Cash balance on 3rd May	£4,370	16	0

967. *Reports of Work* for April were submitted and approved.

968. *Library.*—A list of publications received since last meeting was laid on the table.

63, *Victoria Street, S.W.*, 18*th May*, 1904.

PRESENT :

PROFESSOR DARWIN (IN THE CHAIR).

MR. BUCHAN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

969. The Minutes (954–968) of the last meeting (4th May) were read and confirmed.

970. *Annual Report.*—The Secretary reported that all the appendices, with the exception of those relating to instruments, the list of contributors of returns on Form 51, and the list of publications received, had been sent to the Press.

Approved.

971. *International Meteorology.*—Read—M.O. 1,105 from Professor Hildebrandsson asking for the issue of an English edition of his "Rapport sur les observations internationales des nuages au comité international météorologique" presented at the Southport meeting of the Committee, the French edition having become nearly exhausted, and there being evidence of a considerable demand for copies in England and America.

The Secretary suggested that a translation of the report might be included in the English edition of the report of the Southport meeting of the International Committee which was now in proof, and read a further letter from Professor Hildebrandsson stating that there were no blocks for the illustrations which could be lent, but that the lithographer would supply 1,000 copies for 450 kr. (18 kr. = £1).

The consideration of the suggestion was postponed.

972. *International Telegraphic Service* (Minutes 875, 943).—Read—M.O. 1,070 from the Seewarte expressing a preference for the Old Head of Kinsale as a station for 7 a.m. observations in lieu of Roche's Point.

The Secretary was directed to make the necessary arrangements and was authorised to pay a sum not exceeding £10 per annum for the observations, to be charged to the Seewarte.

973. *International Cloud Atlas.*—Read—M.O. 1,130 from Professor Hergesell stating that arrangements were in progress with M. Teisserenc de Bort for the issue of a new edition of the International Cloud Atlas, and asking for observations upon points of detail with a view to improving the Atlas where necessary.

The Secretary reported that he had written to the Observatories and other correspondents of the Office interested in cloud observations asking for any suggestions that had occurred to the observers, and that he proposed to forward any suggestions received to Professor Hergesell.

Approved.

974. *Publications: Proposed Pilot Charts for the Indian Ocean* (Minute 956).

The reply of the Meteorological Reporter to the Government of India was considered, and, after discussion, the Secretary was directed to draft a letter upon the subject.

975. *Publications: O.* 123 (Minutes 871, 945).—Read—The following letter :—

M.O. 1,162.

11th May, 1904.

SIR,

I AM desired by the Controller to acknowledge the receipt of your letter of the 9th instant, and to express his regret that, in the absence of special authority to do so from the Lords Commissioners of the Treasury, he will not feel himself able to order a reprint of the Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand.

Should, therefore, the Meteorological Council consider the reprint essential, they will, perhaps, represent the facts directly to the Treasury and obtain their Lordships' sanction.

I am to remind you that in the reply sent to the Circular issued when the Estimate for the present year was under consideration no mention was made of the reprint in question, which would, probably, if undertaken, involve an expenditure of more than £200.

The Controller is advised that the process of photo-lithography would be inapplicable, as the portions now coloured in buff would, if printed from stones prepared by this process, appear in black.

I am, &c.,

E. B. PLOWMAN,
Assistant Controller.

The Secretary,
Meteorological Office.

976. *Publications: Presentation Copies* (i.). *Daily Weather Report.*—Read—M.O. 1,045 from the Head Mistress of the Cork High School asking for a free copy of the Daily Weather Report for educational uses.

Resolved—That a present be made in such cases of surplus charts, but not of the current (daily) issues.

—— —— (ii.) *Weekly Weather Report and Monthly Summaries.*—The Secretary reported that he had sent a circular letter to a number of recipients of the Weekly Weather Report or Monthly Summary with the view of reducing the list of presentation copies, and that he had revised the list in accordance with the replies received.

Approved.

977. *Instruments: Fishery Barometer.*—On the recommendation of the Fishery Board for Scotland it was resolved to lend a Fishery Barometer for the use of the fishermen at Walls, Shetland Isles, to be exhibited on the business premises of Messrs. Inkster and Co., the Telegraph and Post Office, in charge of Mr. A. Tallock, manager of Messrs. Inkster and Co., and the correspondent of the Fishery Board, on the understanding that there would be no difficulty in getting a suitable case.

978. *Gale Tables for E. and N.E. England.*—Read—M.O. 1,108 from the Hydrographer requesting the revision of gale tables in the sailing directions for the East Coast of England, and a memorandum by Mr. Brodie upon the work involved in the revision.

The revision of the tables was authorised.

979. *Logs.*—Seven received—none excellent ; also two abbreviated logs.

980. *Storm Warnings* :—

Signals hoisted on 1 day ; total number of districts warned, 7.

In 3 districts the warnings were justified by subsequent strong winds (force 7 or 6). In 4 districts they were not required.

Gales experienced for which no Warnings were issued.—None.

981. *Forecasts* for April, 1904 :—

The letters used have the following signification :

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	43	70	57	89
,,	b	37	27	32	
,,	c	17	3	10	
,,	d	3	0	1	
Scotland, E.	a	43	73	58	92
,,	b	47	20	34	
,,	c	7	7	7	
,,	d	3	0	1	
England, N.E.	a	47	57	52	89
,,	b	37	37	37	
,,	c	16	6	11	
,,	d	0	0	0	
England, E.	a	40	57	49	92
,,	b	50	37	43	
,,	c	7	6	7	
,,	d	3	0	1	
Midland Counties	a	33	57	45	84
,,	b	44	33	39	
,,	c	23	7	15	
,,	d	0	3	1	
England, S.	a	50	57	54	92
,,	b	43	33	38	
,,	c	7	7	7	
,,	d	0	3	1	
Scotland, W.	a	60	77	69	96
,,	b	34	20	27	
,,	c	3	3	3	
,,	d	3	0	1	
England, N.W.	a	43	60	52	90
,,	b	47	30	38	
,,	c	7	10	9	
,,	d	3	0	1	
England, S.W.	a	40	47	44	86
,,	b	47	37	42	
,,	c	3	10	6	
,,	d	10	6	8	
Ireland, N.	a	64	67	66	92
,,	b	23	30	26	
,,	c	10	3	7	
,,	d	3	0	1	
Ireland, S.	a	34	50	42	89
,,	b	50	44	47	
,,	c	13	3	8	
,,	d	3	3	3	
Summary					
British Islands	a	45	61	53	90
,,	b	42	32	37	
,,	c	10	6	8	
,,	d	3	1	2	

982. *Harvest Forecasts.*—Resolved—That the request of Mr. W. T. Madge, manager and proprietor of "The People," for the special Saturday evening forecasts prepared for the Harvest Forecast Service be complied with (M.O. 1186A).

983. *Exhibition of Forecasts.*—In compliance with the request of Mr. Tresidder (M.O. 1,230), the Secretary was authorised to make arrangements for exhibiting the evening forecasts and door-board charts outside the street door after office hours, and to provide for the lighting of the doorway in such manner that the forecast and charts can be seen.

984. *Accounts.*—It was resolved that £750 be invested in 2½ per cent. annuities as an addition to the reserve for superannuation (Minute 716).

985.—*Accounts.*—Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 3rd May	4,370	16	0
Receipts from 4th to 17th May	92	2	2
	4,462	18	2
Cheques drawn from 4th to 17th May	258	15	6
Cash balance on 17th May	£4,204	2	8

986. *Library.*—A list of the publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 1st June*, 1904.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

PROFESSOR DARWIN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

987. The Minutes (969–986) of the last meeting, 18th May, 1904, were read and confirmed.

988. *Annual Report.*—Proofs of a number of Appendices were submitted, and it was resolved to add an Appendix giving the list of institutions and persons to whom presentation copies of the Council's publications are sent.

989. *Publications* : *Proposed Pilot Charts for the Indian Ocean* (Minute 974).

A draft letter to the Meteorological Reporter to the Government of India was approved, after amendment, as follows :—

SIR,

I AM directed by the Meteorological Council to acknowledge the receipt of your letter of 6th April, 1904, and to thank you for the various suggestions contained therein.

2. The Council would not regard the publication of Pilot Charts, such as they have contemplated, as alternative to the publication of an Atlas for the Indian Ocean, or as likely to supersede it, but as supplementary thereto. The Council concur in the opinion which you express, that an

Atlas would be the most convenient form for the issue of meteorological results for the Ocean, but it has been found that the majority of Captains will not purchase an Atlas. Under the system of this Office, however, a Captain who keeps a meteorological log for the Office is presented with a copy of the monthly chart, and for these charts he is ready to furnish observations which would not be obtained otherwise.

3. The Office has been engaged for the past 18 months upon the discussion of the material for a series of monthly wind charts of the Indian Ocean, which would be issued in a form more or less similar to the Atlas of "Meteorological Charts of the Southern Ocean, between the Cape of Good Hope and New Zealand" (Official, No. 123, 1899). They will show the general characteristics of pressure and temperature as well as the wind roses. It is expected that the work will be completed within two years from the present time. Monthly current charts have already been published (1896) and surface temperature charts (1884).

4. The atlas of wind charts, when complete, would be issued to H.M. ships, and copies would probably be purchased by the larger shipping companies. The Council will be glad to co-operate as far as they can by supplying information to be incorporated in your Atlas; at the same time they will be glad if they may reckon upon your contributing any data which would supplement their own, where necessary, for the wind charts.

5. The Pilot Charts would be on a different footing. They are intended to stimulate an interest among sailors in the collection of trustworthy observations and their application to practical navigation. For that reason they are distributed largely as presentation copies, in single sheets. The main part of the information upon any chart is derived from various publications, and does not vary from year to year, but it is supplemented by a certain amount of recent information that is regarded as being either practically useful to sailors or a desirable addition to the material for the study of general meteorology. As regards the latter, and therein sea surface temperatures may probably be included, the Council think that the information should, from the nature of the case, go a little beyond what is already accepted by seamen as directly applicable.

6. It is understood that any observations obtained in this Office for 8 a.m. (local time) within the area approximately bounded by the 45th parallel of S. latitude and the 20° to 130° lines of E. longitude, shall be transcribed and forwarded to you for your daily charts as soon as the logs containing them have been examined; also, that if monthly Pilot Charts are to be issued on the lines of the specimen sent to you, the publication must be undertaken by the Council, but that you will give any help you can.

7. To summarise what has been said above, the Council will contribute whatever they can to the preparation of a meteorological atlas of the Indian Ocean, such as you contemplate, and will be glad to receive from you any contributions of material that you may have in an available form, for the series of monthly wind charts now being compiled here, which will also show isobars, isotherms, and such details of coast meteorology as may be conveniently included. As to this a specific request will be addressed to you later.

8. The Council will be glad to consider any further suggestions that occur to you in connexion with this correspondence.

I am, Sir,
Your obedient Servant,
W. N. SHAW,
Secretary.

990. *International Meteorology* (Minute 971).—It was agreed that inquiry be made as to whether the Royal Meteorological Society would undertake the printing and distribution of Hildebrandsson's report on the motion of clouds, the Council undertaking to supply the translation and 500 copies of the lithographs in accordance with Professor Hildebrandsson's letter (M.O. 1,105 (i.)).

991. *Publications: London Fog Inquiry.*—Submitted—A draft official report as introduction to the reports of Captain Carpenter and Mr. Lempfert.

Approved.

992. *Publications: Hourly Readings, &c.*—Submitted—Complete proof of the volume of hourly readings for 1900, with introduction and preface.

Approved.

993. *Colonial Observations.*—Authority was given to apply to the Army Medical Department for observations in the neighbourhood of the North Atlantic anticyclone at stations in connexion with the Department (Min. 896).

994. *Instruments: Limits of Error in Tests of Marine Barometers.*—Read—M.O. 1,273 from Dr. Chree.

It was resolved to make no change in the specification of the limits of error in marine barometers.

995. *South Atlantic Charts.*—Permission was given to the Marine Superintendent to offer a paper on the South Atlantic Wind Charts to the British Association meeting at Cambridge.

996. *Logs.*—Eight received, two excellent—Captain W. G. S. de Carteret and Captain G. S. Webster.

997. *Storm Warnings.*—None issued—no gales.

998. *Accounts: Post Office Charges for Telegrams from Roche's Point.*—Read—M.O. 1,288 from the Post Office, suggesting the increase of the payment to the telegraphist at Roche's Point to 2*s.* for Sunday attendance.

The Secretary was directed to call the attention of the Post Office to the fact that the payment already made to the observer, who is also the telegraphist, includes the necessary Sunday attendance, and to represent that when the same person acts as observer and telegraphist, the payment should be fixed on an inclusive basis.

999. *Accounts* (i.).—Reported—The purchase of £829 16*s.* 5*d.* 2½ per cent. annuities in pursuance of Minute 984.

—— (ii.). Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 17th May	4,204	2	8
Receipts from 18th to 31st May	61	6	0
	4,265	8	8
Cheques drawn from 18th to 31st May	1,692	5	8
Cash balance on 31st May	2,573	3	0

1000. *Reports of Work* for the month of May were submitted and approved.

1001. *Library.*—A list of publications received since last meeting was laid on the table.

63, *Victoria Street, S.W.*, 15*th June*, 1904.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

1002. The minutes (987–1001) of the last meeting, 1st June, were read and confirmed.

1003. *Annual Report.*—Submitted—A draft of the introductory portion of the annual report.

It was agreed that the draft be printed and circulated.

1004. *Colonial Observations.*—Read—The following letter :—

M.O. 1,408.

METEOROLOGICAL INSTRUMENTS.

Whitehall Gardens,
London, S.W.,
10th June, 1904.

SIR,

OUR attention has recently been called to Circular No. 55 issued by your office, on page 5 of which is indicated an arrangement for the supply of instruments. We have demands from time to time from the various colonies and protectorates for which we act for Meteorological Instruments, and it is possible that some of these administrations might wish to avail themselves of the arrangements you propose if the matter were brought to their notice.

We shall be glad to know, therefore, whether you are prepared to supply them as required to our order, on receipt of demands from the Colonies; and whether the rendering of returns of the observations would in every case be regarded as a *sine quâ non*.

For the information of Colonial Governments we should be prepared to send a circular letter to all the Administrations concerned calling their attention to the arrangement. The decision as to availing themselves of it or otherwise would, of course, rest with them. It would seem desirable for our circular letter to be accompanied by copies in duplicate of the two pamphlets containing "Hints to Meteorological observers in Tropical Africa," and your "Memorandum on the requirements of a normal climatological "station," but as to this we should be glad of your opinion.

We presume that the Council would furnish us with the necessary copies of these documents or any others which it might be thought desirable to send.

I am, &c.,
M. A. CAMERON.

The Secretary,
Meteorological Council.

The Secretary reported that in the course of the current year he had arranged for the supply or inspection of apparatus for the Crown Agents to the extent of £1,000 for the Transvaal and the Orange River Colony. He also reported that in order to supply instruments satisfactorily for tropical stations, it would be necessary to obtain a specimen of the wire cage prescribed in the "Hints to Meteorological Observers in Tropical Africa," and to make provision for its supply.

It was agreed to supply instruments as suggested in the Crown Agent's letter, together with the copies of documents required, and in the case of instruments required by public departments not to make the return of observations a *sine quâ non* of the supply on the terms for the issue of instruments to observers.

1005. *Royal Meteorological Society: Kite Observations* (Minutes 927 and 939).—Read—Letters from Mr. Dines (M.O. 1380 and 1423) asking for (1) the loan of instruments to be used at Crinan in connexion with the kite experiments in the course of the summer, on board H.M.S. "Seahorse," which were arranged to commence on 17th June, and (2) for telegraphic reports of the direction and magnitude of the barometric gradient to be sent to Crinan daily to arrive at 10 a.m., together with a forecast for the day.

It was agreed to comply with both requests.

1006. *Forecasts.*—Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of May, 1904 :—

The letters used have the following signification :—
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	52	65	59	88
,,	b	32	26	29	
,,	c	13	6	9	
,,	d	3	3	3	
Scotland, E.	a	65	65	65	88
,,	b	23	22	23	
,,	c	6	10	8	
,,	d	6	3	4	
England, N.E.	a	58	65	62	89
,,	b	26	29	27	
,,	c	13	6	10	
,,	d	3	0	1	
England, E.	a	39	65	52	86
,,	b	42	26	34	
,,	c	13	9	11	
,,	d	6	0	3	
Midland Counties	a	58	71	65	89
,,	b	26	23	24	
,,	c	16	3	10	
,,	d	0	3	1	
England, S.	a	62	74	68	94
,,	b	32	20	26	
,,	c	3	6	5	
,,	d	3	0	1	
Scotland, W.	a	49	68	59	86
,,	b	26	29	27	
,,	c	19	3	11	
,,	d	6	0	3	
England, N.W.	a	61	68	65	97
,,	b	32	32	32	
,,	c	7	0	3	
,,	d	0	0	0	
England, S.W.	a	52	81	67	91
,,	b	32	16	24	
,,	c	13	0	6	
,,	d	3	3	3	
Ireland, N.	a	52	65	59	85
,,	b	26	26	26	
,,	c	16	3	9	
,,	d	6	6	6	
Ireland, S.	a	52	74	63	82
,,	b	22	16	19	
,,	c	26	7	17	
,,	d	0	3	1	
SUMMARY.					
British Islands	a	55	69	62	89
,,	b	29	24	27	
,,	c	13	5	9	
,,	d	3	2	2	

1007. *Stations: London.*—The Secretary reported the receipt of a letter from Major Hussey of H.M. Office of Works, reminding him that he was awaiting proposals for the establishment of a station in one of the parks and the exhibition of daily information and forecasts.

The Secretary was directed to make arrangements in consultation with Major Hussey.

1008. *Forecast Districts Inquiry* (Minute 948).—The Secretary was authorised to proceed to Edinburgh in order to read a paper on the results of the inquiry into the subdivision of the forecast districts before the Scottish Meteorological Society in November next.

1009. *Instruments: Mercantile Marine:—*

RETURN OF AVAILABLE INSTRUMENTS AT AGENCIES AND M.O. FOR THE QUARTER ENDING 15TH MARCH, 1904.

Agency.	Barometers.				Thermometers.				Hydrometers.				Screens.			
	Est.	Store.	+	—	Est.	Store.	+	—	Est.	Store.	+	—	Est.	Store.	+	—
Cardiff	6	2	—	4	36	18	—	18	24	10	—	14	6	6	—	—
Dundee	6	4	—	2	36	9	—	27	24	14	—	10	6	—	—	6
Glasgow	6	9	3	—	36	37	1	—	24	32	8	—	6	8	2	—
Hull	3	4	1	—	18	16	—	2	12	14	2	—	3	4	1	—
Liverpool	6	7	1	—	36	21	—	15	24	15	—	9	6	4	—	2
Southampton ...	6	5	—	1	36	19	—	17	24	6	—	18	6	6	—	—
Sunderland	4	3	—	1	24	24	—	—	16	16	—	—	4	4	—	—
Totals ...	37	34	5	8	222	144	1	79	148	107	10	51	37	32	3	8
Net shortages ...	—	—	—	3	—	—	—	78	—	—	—	41	—	—	—	5
Meteorological Office	20	7	—	13	120	27	—	93	80	22	—	58	20	5	—	15
Repairing ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Returnable ...	—	—	5	—	—	—	10	—	—	—	—	—	—	—	—	—
Ordered ...	—	—	—	—	—	—	138	—	—	—	52	—	—	—	10	—
	—	—	+	—	—	—	+	—	—	—	+	—	—	—	+	—
Net surplus or shortage.	—	—	—	8	—	—	55	—	—	—	—	6	—	—	—	5
Proposed to be ordered	—	—	(12)	—	—	—	(52)	—	—	—	(50)	—	—	—	(10)	—

6th June, 1904. R. F. WALLACE.

1010. *Royal Navy: Quarterly Return:—*

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 31st MARCH, 1904.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st Jan., 1904	74	79	10	63	48	37
	Received, new	—	—	150	—	—	—
	„ cleaned and repaired.	26	31	—	21	23	—
	Totals	100	110	160	84	71	37
	Issued	35	45	108	31	42	27
	Total available 1st April, 1904.	65	65	52	53	29	10

RETURN of ADMIRALTY INSTRUMENTS for the QUARTER ending 31st MARCH, 1904.

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.
†Portsmouth	25	14	—	11	55	36	—	19	150	95	—	55	50	49	—	1	50	57	7	—	25	13	—	12
†Devonport	25	18	—	7	55	53	—	2	150	128	—	22	50	48	—	2	50	49	—	1	22	22	—	—
Chatham	25	28	3	—	55	52	—	3	150	150	—	—	50	51	1	—	50	53	3	—	25	26	1	—
Sheerness	6	5	—	1	15	11	—	4	30	21	—	9	10	7	—	3	10	7	—	3	10	11	1	—
Queenstown	5	4	—	1	10	8	—	2	15	15	—	—	8	7	—	1	8	7	—	1	—	2	2	—
(Dockyards, Home) Totals	86	69	3	20	190	160	—	30	495	409	—	86	168	162	1	7	168	173	10	5	82	74	4	12
Gibraltar	2	3	1	—	2	1	—	1	4	8	4	—	3	3	—	—	3	3	—	—	—	—	—	—
†Malta	11	5	—	6	15	12	—	3	60	50	—	10	10	9	—	1	10	7	—	3	1	2	1	—
Bombay	4	2	—	2	3	2	—	1	10	12	2	—	4	2	—	2	4	5	1	—	1	2	1	—
Halifax	3	1	—	2	4	4	—	—	20	21	4	—	4	4	—	—	4	4	—	—	1	—	—	1
†Bermuda	3	1	—	2	4	3	—	1	20	22	2	—	4	4	—	—	4	3	—	1	1	1	—	—
Jamaica	3	1	—	2	2	4	2	—	10	9	—	1	2	2	—	—	2	2	—	—	1	1	—	—
Cape of Good Hope	7	3	—	4	8	5	—	3	33	22	—	11	8	7	—	1	8	4	—	4	2	2	—	—
Trincomalee	3	2	—	1	3	2	—	1	10	9	—	1	4	5	—	—	4	4	—	—	1	1	—	—
Hong Kong	17	12	—	5	21	28	7	—	87	57	—	30	21	16	—	5	21	15	—	6	5	11	6	—
Sydney	5	5	—	—	6	5	—	1	25	16	—	9	6	9	3	—	6	11	5	—	1	1	—	—
Esquimalt	4	2	—	2	5	9	4	—	15	19	4	—	2	2	—	—	2	3	1	—	1	2	1	—
(Dockyards, Abroad) Totals	62	37	1	26	73	75	13	11	294	248	16	62	68	63	4	9	68	61	7	14	15	23	9	1
Grand Totals and Net Shortage at Depôts	148	106	—	42	263	235	—	28	789	657	—	132	236	225	—	11	236	234	—	2	97	97	—	—
At Meteorological Office ...	45	65	20	—	120	65	—	55	250	52	—	193	80	53	—	27	80	29	—	51	50	10	—	40
Repairing	—	—	10	—	—	—	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Returnable from Depôts ...	—	—	40	—	—	—	51	—	—	—	44	—	—	—	21	—	—	—	20	—	—	—	4	—
Ordered	—	—	—	—	—	—	50	—	—	—	210	—	—	—	28	—	—	—	10	—	—	—	25	—
Net Surplus or Shortage at M.O.	—	—	+70	—	—	—	+60	—	—	—	+56	—	—	—	+22	—	—	—	—	−21	—	—	—	−11
Proposed to be Ordered ...	—	—	(−)	—	—	—	(−)	—	—	—	(120)	—	—	—	(−)	—	—	—	(24)	—	—	—	(15)	—

† Supplies have been sent since 31st March, 1904.

NOTE.—No change has occurred in the Stocks of Hydrometers.

10th June, 1904.

R. F. WALLACE.

1011. *International Aeronautical Committee Meeting at St. Petersburg.*—Read—M.O. 986 from General Rykatcheff, urging the importance of the attendance of a representative of the Council at the fourth meeting of the Committee at the end of August.

The Secretary was authorised to attend the meeting on behalf of the Council if he was able to do so.

1012. *Inspections.*—The Secretary was authorised to make arrangements for the inspection of stations as in previous years.

A grant of £25 was made, as in previous years, to the Royal Meteorological Society to defray the cost of the inspections of the stations in connexion with the Society (M.O. 1424).

The Secretary reported that he had arranged to have a meeting of inspectors at 12 noon on 16th June.

1013. *Publications: Official Copies.*—It was resolved to apply to the Admiralty for an additional supply of copies of O. 132 (Monthly current charts of the Atlantic Ocean) and O. 124 (Monthly current charts of the Indian Ocean), the office stock having become exhausted.

1014. *Instruments: Aneroid Barometers.*—Read—M.O. 1403 from Dr. Chree, representing that the manufacturers had raised objections to the new conditions of test adopted by the Council (Minute 157, 1901–2), at the suggestion of the National Physical Laboratory.

The Secretary was directed to ask the National Physical Laboratory for suggestions as to the limits of error to be allowed in the instruments supplied for the use of the Council.

1015. *Logs.*—Nine received: Two excellent—Capt. F. C. Mullan and Capt. W. M. Porterfield.

1016. *Storm Warnings*:—

Signals hoisted on 1 day; total number of districts warned, 7.

In 4 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 2 districts by subsequent strong winds (force 7 or 6). In 1 district they were not required.

Gales experienced for which no Warnings were issued.—None.

1017. *Accounts: Telephone.*—The Secretary reported that the use of the telephone had been found convenient and economical and that he had continued the subscription for another year at the message rate. Also that a charge of 2*d.* each message had been made for messages sent by members of the staff and others which were not on official business.

Approved.

1018. *Accounts* (i.): *Audit.*—Reported—That the cash accounts for the quarter ended the 31st March last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st January last, when there was a balance of £1,429 9*s.* 0*d.*, were £5,289 2*s.* 3*d.* against £5,348 14*s.* 3*d.* in the corresponding period of the preceding financial year. The payments were £5,228 18*s.* 8*d.* against £5,183 5*s.* 11*d.* during the same period in the previous year. The balance in hand and at the bank on the 31st March, amounted to £1,489 12*s.* 7*d.*, and at the same date in 1903 to £1,776 2*s.* 5*d.*

—— (ii.)—Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 31st May	2,573	3	0
Receipts from 1st to 14th June	28	19	0
	2,602	2	0
Cheques drawn from 1st to 14th June	62	10	0
Cash balance on 14th June	£2,539	12	0

1019. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 1st July*, 1904.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

1020. The Minutes (1002–1019) of the last meeting, 15th June, were read and confirmed.

1021. *Annual Report.*—Proofs of the introductory portion and of the appendices, with the exception of Nos. I., II., and X., were submitted and approved.

It was agreed that a paged revise should be circulated, and taken as approved if no objection was raised by the members of the Council.

1022. *Publications: Reproduction of O.* 123 (Minute 975).—Read—M.O. 1505 from the Hydrographer, suggesting that "steps be taken to get the Stationery Office to do it next year, as it is of great value to shipping in general."

Approved.

1023. *Colonial Observations: Supply of Instruments to the Crown Agents* (Minute 1004).—(i.) Read—The following letter and circular :—

No. 1558.

Crown Agents for the Colonies,
Whitehall Gardens,
London, S.W.,
June 27th, 1904.

STORES CIRCULAR.—METEOROLOGICAL INSTRUMENTS.

SIR,

I HAVE to thank you for your letter of the 18th June, respecting the arrangement under which the Meteorological Council would be prepared to supply instruments to our order on receipt of demands from the Colonies.

2. Since writing to you on the 10th of June, it has been pointed out to us that in Circular No. 55 the charge made by the Meteorological Office for the supply of instruments under the conditions stated is laid down as 5 per cent. We presume, however, that the Council would be prepared to supply us at the same rate as in the past, viz., 2½ per cent. on the invoiced cost f.o.b. an English port. I regret that this point was not referred to in our previous letter.

3. I enclose for any observations or suggestions you may wish to make a draft of the circular letter which we should propose to issue to the Administrations for which we act.

4. It would be as well for you to have Circular No. 55 completed as suggested in the last paragraph of your letter. Will you then furnish us with 120 copies of each circular to forward to the Colonies.

I am, &c.,
M. A. CAMERON.

The Secretary,
Meteorological Office,
63, Victoria Street, S.W.

(Draft for printed circular letter to all Colonies and Protectorates.)

STORES CIRCULAR.—METEOROLOGICAL INSTRUMENTS.

SIR,

I HAVE the honour to inform you that we have ascertained from the Meteorological Council of 63, Victoria Street, S.W., that they would be willing to act for us as expert buyers of meteorological instruments, and would, in addition, examine the instruments before despatch. Their charge for these services would be 2½ per cent. on the invoiced cost f.o.b. in an English port. This percentage does not, of course, include the cost of standardization at the National Physical Laboratory, Richmond. When this is necessary it would entail a separate charge.

3. I enclose copies in duplicate of two pamphlets issued by the Meteorological Office :—

1. Hints to Meteorological observers in Tropical Africa (Official, No. 162).

2. Memorandum on the requirements of a normal climatological station (Circular No. 55).

In the latter of these is given a list of approximate prices of instruments, in which, however, a commission of 5 per cent. is included.

4. It will be seen from these publications, that the Meteorological Office usually require as a condition of supplying instruments, to be furnished with copies of the observations made. No such condition is required from your Government, as the supply of such returns is considered to be already sufficiently ensured by the instructions laid down by Mr. Chamberlain in his circular despatch of the 27th July, 1895.

5. We have already availed ourselves in some cases of the services of the Meteorological Office with results satisfactory to the Governments concerned. Should your Government desire us to employ the Meteorological Office in the execution of indents for meteorological instruments, a note to that effect should appear on each indent.

6. If your Government intend to make it a standing practice to ask us to employ the Meteorological Office, it would be a convenience if we were so informed at once. The Meteorological Office would then, if desired, supply free of cost, whatever observation forms and reduction tables you require.

I have the honour to be, &c.,

The Secretary was directed to point out—

(i.) That the charge of 5 per cent. for departmental expenses is applicable in the case of the supply of a single set of instruments for an observer, and that 2½ per cent. would be charged in the case of the supply of instruments for Colonial Governments.

(ii.) That the Council desired to have a copy of the original observations if possible, although they did not propose to make the supply of the copy a *sine quâ non* for the supply of instruments upon repayment; that Mr. Chamberlain's despatch of 27th July, 1895, referred only to reports or returns published in the Colonies, and it was therefore desirable to intimate in the circular the wish of the Council as regards copies of observations.

(iii.) That forms are only supplied free of cost when it is understood they will be returned to the office in due course.

—— —— (ii.) Read—M.O. 1550 from the Crown Agents, with a form of tender for the supply of certain meteorological instruments for Uganda.

The Secretary was directed to comply with the request provided that the undertaking to supply the instruments be put in a form suitable to the circumstances of the office.

1024. *Colonial Observations: British East Africa.*—Read—the following letter received from the Foreign Office :—

M.O. 1493.

Mombasa,
16th March, 1904.

SIR,

I FORWARD herewith the meteorological returns from fourteen stations for 1903. The average amount of rain did not fall in the coast region during this period, only 33·84 inches being recorded at Mombasa, 23·24 inches at Malindi, 35·18 inches at Rabai, and Takaungu received 33·72 inches.

Shimoni fared better in this respect, as 42·51 inches fell at that station.

At such up country districts as Mumias, Kisumu and Fort Hall, the amount of rain has been well up to the average. 80 inches fell at Mumias, 60 at Kisumu, and 51 at Fort Hall. At Nairobi only 42 inches fell and at Eldoma Ravine 45 inches. The number of rainy days, *i.e.*, days on which at least 0·01 inches of rain fell, varied from 23 for Kismayu to 174 for Eldoma, and at Machakos the number was 93; at Fort Hall 110; at Nairobi 111; at Kisumu 127; and at Mumias 145.

The greatest amount of rain which fell in one day was 5·61 at Machakos on 28th April and the next heaviest rainfall was 4·77 inches at Nairobi on 27th April. Other heavy rains were 3·50 inches at Kisumu on 16th May and 3·06 inches at Kitui on 8th May.

On the coast region the heaviest recorded rainfall was 3·15 inches at Shimoni on 2nd November and 2·30 inches at Mombasa on 1st November, and 3·05 inches at Rabai on 3rd November.

Again at Shimoni on 6th April 2·91 inches fell, and at Mombasa on the same date 2·30 inches fell; while at Rabai they had only 0·96 inches.

A heavy fall occurred in Shimoni on 27th December no less than 2·25 inches being measured; but only 0·56 inches were registered at Rabai on this day and nothing at Mombasa.

At Takaungu and Malindi the heaviest fall took place in May; 1·65 inches having fallen at the first place on 30th; and 2·56 inches at Malindi on 10th of that month.

As the question of the rainfall is important for agricultural purposes, I am endeavouring to increase the number of stations at which such observations would be useful and I shall have to ask for more rain gauges very soon.

The Egyptian Survey Department having asked for returns relating to the Lake levels and also for returns of rainfall from places where the amount of water in the Lake would be affected by the amount of rainfall, I have forwarded intruments to the stations in question, viz. :—Nandi, Kericho and Karungu. And as I am advised that the Railway officials have been recording the rainfall at Mohoroni, I intend to ask for their returns, this being one of the places from which records may be asked for in future by the Egyptian Survey.

A supply of instruments has also been sent to Morendat and to Nairobi and I hope in the very near future to supplement those already at Fort Hall.

I have, &c.,
J. T. C. JOHNSON.

Sir C. Eliot, K.C.M.G., C.B.,
&c., &c., &c.

The Secretary was authorised to send an extract from Dr. Johnson's despatch to "Nature."

1025. *Colonial Observations: Southern Nigeria.*—Read—M.O. 1477 from R. M. Reynolds, Lieut. R.N.R., Marine Officer, Southern Nigeria, offering to take meteorological observations, "sometimes up the river, sometimes on the coast," on his return to the coast.

The Secretary was directed to explain the limitations under which instruments are lent, and to ask Lieut. Reynolds to call at the office if he should be in London before leaving for Nigeria.

1026. *Colonial Observations: St. Helena* (Minute 777.)—Read—M.O. 1029 from Major Paske, forwarded by the Hydrographer, reporting upon the anemometer at St. Helena.

The Secretary was authorised to send out two spare pencils as suggested and to convey the thanks of the Council to Major Paske, and to write concerning the adjustment for damping the direction oscillations.

1027. *International Meteorology: Report on Cloud Observations* (Minutes 971, 990). —Read—the following reply from the Royal Meteorological Society :—

M.O. 1509.

Royal Meteorological Society,
20th June, 1904.

DEAR DR. SHAW,

YOUR letter of the 9th instant, asking the Society to publish an English edition of Professor Hildebrandsson's report on the results of the international cloud observations, was laid before the Council at their meeting last Wednesday.

The Council are willing to print a translation of the report as a paper in the Quarterly Journal of the Society, provided that the Meteorological Council make the translation and supply the neccessary illustrations for the same. The illustrations, however, must be suitable to the size of the pages of the Journal (clichés would be preferable to lithographs), and the temperatures and measurements should be converted into English values.

If your Council agree to the above, it is desirable that the M.S. of the translation should be sent to the Society not later than September 1st, in order that the paper may appear in the October number of the Journal.

I am, &c.,
FRANCIS CAMPBELL-BAYARD,
Secretary.

Dr. W. N. Shaw,
Secretary,
Meteorological Office.

It was resolved to proceed with the translation on the terms set out.

1028. *Publications: Presentation Copies.*—Read—M.O. 1488 from Sir J. Eliot, asking for a copy of the Weekly Weather Report and the scientific publications of the Office to be sent to his London address for a library he is making for his meteorological work there.

It was resolved to send a copy of the Weekly Weather Report, and to await further particulars concerning other publications desired.

1029. *Storm Signals: Italy.*—Reported—The receipt of particulars of Italian storm signals from the Italian Embassy through the Foreign Office.

The Secretary reported that the particulars had been reproduced on the July Pilot Chart.

Approved.

1030. *Forecasts: Exhibition at the Office Door.* — Submitted — Estimates from Mr. Bond amounting to £10 8*s.* 5*d.* for new frames and gas supply.

Approved—On the understanding that the cost should be reduced if possible.

1031. *Proposed Station in St. James's Park.*—The Secretary reported that arrangements were in progress for placing a screen, and a self-recording and a check rain gauge in St. James's Park, near the path leading from the Bridge to the Horse Guards' Parade on the North side of the bird enclosure. Also for the exhibition of a daily chart, forecasts, and records in a case near the Parade Gate.

Approved.

1032. *Daily Weather Report.*—Reported—That from July 1st it was proposed to exhibit in Chart IV. on p. 2 of the Daily Report the particulars for each forecast district as to extremes of temperature, weekly sunshine, weekly rainfall, aggregate sunshine and rainfall, with weekly and aggregate accumulated temperature above 42° F. for the week ended on the preceding Saturday in successive days of each week, commencing with Tuesday.

Approved.

1033. *Forecasts.*—Read—M.O. 1321 from Rev. J. W. A. Mackenzie respecting difficulties in connexion with obtaining and making payment for special telegraphic reports of the weather with a view to carrier pigeon competitions.

The Secretary was directed to arrange if possible for the difficulties to be met by the use of a code.

1034.—*Prizes for Meteorology: H.M.S. "Conway" and "Worcester."*—Submitted—The following report :—

The results of the examinations of the Cadets in Meteorology, held on board the Training Ships "Worcester" and "Conway" on the 27th June, are as follows :—

"WORCESTER."

Clarence Esser Graves led with 80 marks.
E. H. Bond gained 68 marks.
R. T. Snape gained 64 marks.

25 Cadets took part in the examination, and the average number of marks obtained is 40.

"CONWAY."

R. L. Vine led with 81 marks.
E. L. M. Shepherd gained 76 marks.
C. G. Hallett gained 72 marks.

24 Cadets took part in the examination, and the average number of marks obtained is 59.

C. H.,
1st July, 1904.

The presentation of two aneroids as prizes with an inscription on the usual lines was authorised.

1035. *Logs.*—Two received, one excellent (Captain A. L. Paterson) ; also one short log.

1036. *Storm Warnings.*—Since the last meeting of the Council, no warnings have been issued, nor any gales experienced on the coasts of the British Islands.

1037. *Accounts.*—(i). *Payment of Observer at Roche's Point* (Minute 998).—Read—The following letter (M.O. 1559).

General Post Office, London,
27th June, 1904.

SIR,

I AM directed by the Postmaster-General to acknowledge the receipt of your letter of the 13th instant, No. M.O. 1288, respecting the proposal made in the letter of the 27th ultimo for increasing the allowances to the telegraphist at Roche's Point for early and late attendance in connexion with the transmission of Meteorological Reports.

The Postmaster-General has carefully considered the suggestion that in cases where, as at Roche's Point, the telegraphist also receives payment from the Meteorological Office in his capacity of "Observer," that fact should be taken into consideration in fixing the allowances payable to him for telegraphing the Reports ; but, whilst desirous of meeting the wishes of the Council so far as may be

possible, he regrets that in this instance he is unable to do so. Under the Regulations of the Department, telegraphists are entitled to a payment of 1*s.* for each attendance outside the usual hours of business, and the Postmaster-General would not feel justified in requiring the telegraphist at Roche's Point to accept a smaller payment.

I am to suggest, however, that the object desired by the Council would probably be attained by the adoption of a lower scale of payment to the Observers in those cases in which the Observers are also the telegraphists.

I am, &c.,
A. F. KING.

The Secretary,
Meteorological Office.

It was resolved that inquiry be made as to the transfer of the station from Roche's Point to the Old Head of Kinsale.

—— *Accounts* (ii.) *Wages of Messenger.*—The increase of wages for J. S. Edwards, appointed 23rd November, 1903, to 10*s.* per week from 4th July was approved.

—— (iii). *Payment of Observer at Skegness.*—The payment of 5*s.* 6*d.* per week from May 1 for observations at 6 p.m. in addition to those at 7 a.m. for the German Seewarte was approved, the charge to be refunded by the Seewarte.

—— (iv). Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 14th June	2,539	12	0
Receipts from 15th to 30th June	73	14	8
	2,613	6	8
Cheques drawn from 15th to 30th June ...	1,668	16	6
Cash balance on 30th June	£944	10	2

1038. *Reports of Work* for June, except for the Statistical Branch, were submitted and approved.

1039. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 5th October,* 1904.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR),

MR. BUCHAN.
PROFESSOR DARWIN.
CAPTAIN FIELD, *Hydrographer.*
MR. SHAW, *Secretary.*

1040. The Minutes (1020–1039) of the last meeting (1st July) were read and confirmed.

1041. Read—The following letter from Rear-Admiral Sir W. J. L. Wharton :—

M.O. 1,619.

Admiralty, S.W.,
4th July, 1904.

SIR,

I HAVE the honour to acquaint you, for the information of the Meteorological Council, that I retire from the post of Hydrographer of the Navy on 31st July next, and that my place will be taken by Captain Arthur Mostyn Field, R.N., from 1st August, to whom thereafter all communications in connection with the Hydrographer's position on the Council should be addressed.

I have, &c.,
W. J. L. WHARTON,
Hydrographer.

The Secretary,
Meteorological Office.

It was resolved that the Council record their sense of the great value of Admiral Sir William Wharton's services in connexion with the Meteorological Office as a member of the Council during the 20 years over which his tenure of the Office of the Hydrographer to the Admiralty has extended, and as a contributor to the collection of observations of ocean meteorology before he was officially connected with the Office.

They desire to recognise the cordial manner in which he has on all occasions given his co-operation to his colleagues, and direct that his name be placed on the list of persons to whom they present publications.

It was further resolved that a copy of this resolution be communicated to Sir William Wharton.

Captain Arthur Mostyn Field took his seat at the Council as Hydrographer of the Navy in succession to Sir William Wharton.

1042. *International Conference on Scientific Aeronautics* (Minute 1011).—The Secretary reported that at the request of the Board of Education he had attended the fourth International Conference on Scientific Aeronautics at St. Petersburg (29th August to 3rd September) on behalf of the Government, and that on the return journey he had visited the meteorological and aeronautical establishments at Berlin, the observatory at Potsdam, and the Seewarte at Hamburg.

1043. *Constitution of the Council.*—Read—A letter from the Secretary of the Royal Society respecting proposals by the Treasury for the future organisation of the Office consequent upon the report of the Meteorological Grant Committee of H.M. Treasury. (Cd. 2123.)

Professor Darwin was requested to consult Professor Larmor about the matter and report to the Council.

1044. *Ben Nevis Observatory.*—Read—The following letter :—

M.O. 2,163.

Scottish Meteorological Society,
122, George Street, Edinburgh,
22nd September, 1904.

DEAR SIR,

SHORTLY after receiving the Report of the Meteorological Grant Committee the office bearers of this Society wrote to the First Lord of the Treasury asking that the grant recommended in that Report for the Ben Nevis Observatories, namely, £350 per annum, be supplemented by an additional sum of £600 so as to insure the continuance of these Observatories for another year. A reply has recently been received from the Treasury declining to give more than the £350 recommended in the Report. I hope shortly to send you copies of this correspondence, but meantime write to inform you that, as the Directors have not sufficient funds to carry on the Observatories for another year, it has been resolved that the observations at Ben Nevis and Fort William Observatories cease on the 1st of October.

The self-recording instruments at Fort William are the property of the Meteorological Council. I will be glad to learn at your convenience what is proposed to be done with them in the immediate future ; if they are to be taken down and packed up it would be well to have the assistance of some one skilled in that work so as to avoid risk of injury. There would, of course, be no objection to their remaining for some little time at the Fort William Observatory as that building does not immediately pass out of the hands of the Directors.

I remain, &c.,
R. T. OMOND,
Hon. Secretary.

The Secretary,
Meteorological Council.

It was resolved that a copy of the letter should be forwarded to the Royal Society for their information, and that further action in the matter be postponed.

1045. *Antarctic Expeditions: Return of the S.S. "Discovery."*—The Secretary reported the receipt of the meteorological records from the S.S. "Discovery" ; also the receipt of logs of special observations in connexion with the "Antarctic Co-operation" (Minute 9, 1901), with 16,000 days' observations, and of ordinary meteorological logs containing about 8,400 days' observations south of 30° S. for the period of the expeditions.

Also the following letters :—

M.O. 2,238.

Burlington House, London, W.,
30th September, 1904.

DEAR SIR,

As the National Antarctic Expedition has now returned, it is time to report formally to the Meteorological Council the following conclusions of a Committee of the Royal Society drawn up by them in conference with you, and adopted by the Council on April 28th last :—

" (1.) The Committee have reason to think that a satisfactory tabulation and reduction of Meteorological Observations, exclusive of printing, could be completed for £500.

" (2.) They recommend international co-operation, which might extend to co-operation in publishing the daily synoptic charts ; that negotiations should be undertaken at once to this end. But it is not desirable that the main share in the reduction and publication of the Observations, most of which are British, should be delegated to another nation.

" (3.) They recommend that the Meteorological Council be invited to undertake the reduction on these terms.

" It was understood that the Hydrographic Department would view favourably a proposal to have the publication of the results undertaken by H.M. Stationery Office."

As the Royal Geographical Society has made itself responsible for expenses up to £500, which was the cost of reduction of the Observations as estimated by the Meteorological Council, in case the funds belonging to the Expedition prove insufficient, the conditions under which your Council consented to undertake the reduction of the Observations are now fulfilled.

You will remember there is a Committee of the Royal Society consisting of Captain Tizard, Dr. W. N. Shaw, Sir John Murray, Mr. C. T. R. Wilson, Mr. W. H. Dines, Mr. H. N. Dickson, Mr. A. J. Herbertson, of Oxford, Dr. Chree, Professor Larmor, and Dr. H. R. Mill, appointed to co-operate with the Meteorological Council in the matter of the reduction and publication of these Observations. The Royal Society trust that the work may now proceed.

Yours very faithfully,
J. LARMOR,
Secretary, R. S.

Dr. W. N. Shaw, Secretary,
Meteorological Council.

M.O. 2,009.

Downing Street,
29th August, 1904.

SIR,

I AM directed by Mr. Secretary Lyttelton to transmit to you the accompanying copy of a despatch from the Officer Administering the Government of the Falkland Islands respecting certain meteorological data required for the Nordenskjold Antarctic expedition.

2. Mr. Lyttelton will be glad if the particulars desired can be forwarded direct to Dr. Bodman. It is understood that it is the observations at Stanley which are wanted.

I am, &c.,
H. BERTRAM COX.

The Secretary,
Meteorological Office.

Government House,
Stanley,
12th July, 1904.

SIR,

I HAVE the honour to transmit to you a copy of a letter from the Swedish Consul here requesting to be furnished with certain meteorological data for the Nordenskjold Antarctic Expedition and to suggest that the Board of Trade and Meteorological Office be invited to forward the required information direct to Dr. Bodman.

I have, &c.,
(Signed) W. HART BENNETT,
Acting Governor.

The Right Honourable
Alfred Lyttelton, M.P., &c., &c.

Swedish and Norwegian Consulate,
Port Stanley.
11th July, 1904.

SIR,

DR. GOSTA BODMAN, Meteorologist of the Nordenskjold Antarctic Expedition, has requested me to obtain for him observations of temperature, air-pressure, wind, &c. (as fully detailed as possible), during the years 1902 and 1903. I observe from the Blue Book that these data have been sent to the Board of Trade, and would esteem it a favour if your Excellency would invite that department to furnish Dr. Bodman (Yarnbrogatan, 46, Upsala, Sweden) with a copy of the same.

I am, &c.,
(Signed) W. A. HARDING,
Consul.

His Excellency W. Hart Bennett,
Acting Governor.

MO. 2,101.

Scottish National Antarctic Expedition Office,
Surgeons' Hall, Edinburgh,
12th September, 1904.

DEAR MR. SHAW,

I HAVE just received your letter dated April 11th, 1904, and sent to me at Falkland Islands. The letter arrived after my departure from the Falkland Islands, hence the delay.

I would like to have the opportunity of having a conversation with you about the meteorological work of the Falkland Islands during the past two years, and in reference to this may I, in the first place, suggest that it might be a good plan to request Mr. Walter G. Davis, of the Argentine Meteorological Office, Viamonte 668, Buenos Aires, to try and make arrangements for allowing the "Uruguay" to stop at Port Stanley on her return from Scotia Bay, and there to allow Mr. Mossman to inspect the station at the Lighthouse and at Government House. I may point out that Mr. W. Grey-Wilson has received another Colonial appointment, and in consequence there is a new Governor at the Falkland Islands. This may be of importance in regard to the sunshine recorder. With regard to the barograph and the other instruments at Cape Pembroke, I think it would be important to give the lighthouse keeper a personal interview with Mr. Mossman, whom he knows, to explain future arrangements. The keeper, Mr. Pearson, is an excellent man, and I believe thoroughly conscientious and accurate in the matter of observation; but I may say that he is of a rather simple nature, and was rather confused when I met him as to having correspondence from three different sources, namely, from the Governor of the Falkland Islands, from Commander Hepworth (I think), and from yourself. He seemed to be looking for instructions from Commander Hepworth, and could not understand that anybody else had anything to do with the meteorological outfit. I may say that I explained to him as well as I could that any instructions that were received from you were from the head of the office and that others were from the departments of the office. I only mean to indicate that it may be well to make things as simple as possible for Mr. Pearson. He is certainly very enthusiastic over the work and very capable in every respect. By Mr. Mossman's visit a good site could be selected for the exposure of the rain-guage. This would certainly be better at Port Stanley rather than at Cape Pembroke on account of the sand drifts at Cape Pembroke. These sand drifts do not take place at Port Stanley. Have you considered at all the advisability of having an anemometer? With regard to the Richard barograph at Cape Pembroke I could now make arrangements for handing over the instrument to the Meteorological Office. I suppose the Office will be prepared to pay the original cost of the instrument? I should be glad to hear from you on this matter. Whilst at Port Stanley I left some cards for the Richard barograph in addition to those which you had sent. I advised Mr. Pearson not to attempt to adjust the barograph to the new cards as the difference was so slight and could easily be checked from the four hourly mercurial readings. If Mr. Mossman visits the station you might like to alter this arrangement.

On my departure from Scotia Bay last summer Mr. Mossman asked me to ask you if the Meteorological Office would tabulate the observations taken at Port Stanley during the past two years in order that they might be in good form for him to work up on his return in relation to those taken at Scotia Bay. This appears to me to be very important from the meteorological aspect, and I hope the Office will be able to see their way to make a small grant in this direction.

If you were seeking for an outsider to do this work might I recommend Mr. W. F. Rankin, formerly assistant at Fort William and latterly assisting Mr. Stewart at the Meteorological Office at Cape Town, and who returned with the "Scotia" and who is at present tabulating the meteorological results since Mr. Mossman left the "Scotia." He would be, I am sure, very glad of this piece of work at the ordinary rates you would pay anybody else, and I think you would find he would do the work as well as anybody.

It appears to me that the observations might be of a more permanent character at Port Stanley if the overseer or the person in charge of the Admiralty works recently erected there, opposite Port Stanley, had charge of the sunshine recorder, rain-gauge, and the anemometer. In that case the official might be a permanent one, and the captain of one of the warships might be requested from time to time to see how things were going on.

I feel, however, many of these points would be thrashed out more clearly if I had a talk with you.

Thanking you for your kindness in expressing satisfaction in anything I have been able to do in the inspection and setting up of instruments at Port Stanley and Cape Pembroke, I may only say that it has been the greatest pleasure to have undertaken this interesting piece of work.

I am, &c.,
WM. S. BRUCE.

W. M. Shaw, Esq., F.R.S.,
Meteorological Office,
63, Victoria Street, London, S.W.

It was agreed to comply with the request to undertake the reduction of the observations as requested by the Royal Society, and on the terms set forth in Professor Larmor's letter of 30th September.

The Secretary was requested to report further as to the arrangements to be made for carrying out the work, and also upon the work necessary to comply with the requests of the Colonial Office and Mr. Bruce.

1046. *Colonial Observations: Gold Coast* (Minute 962).—Read—The following letter from the Colonial Office in reply to the inquiry as to the supply of instruments :—

M.O. 1,988.

Downing Street,
25th August, 1904.

SIR,

I AM directed by Mr. Secretary Lyttelton to inform you, in further reply to your letter (M.O. 1,077) of the 6th of June last, that a despatch has now been received from the Governor of the Gold Coast on the subject of the offer of the General Manager of the Railway to establish a meteorological station at Sekondi.

2. It appears that a station at that place is about to be established under the charge of the Medical Department of the Colony, and the Governor accordingly does not consider that it will be necessary to establish another station there.

I am, &c.,
H. BERTRAM COX.

The Secretary,
Meteorological Office.

It was resolved to decline Mr. Graves's offer of observations on the terms suggested by him.

1047. *Daily Charts of the Atlantic Ocean.*—Read—The following letter :—

M.O. 1,904.

Hydrographic Office,
Washington, D. C.,
August 3rd, 1904.

SIR,

AMONG the routine duties performed by this Office is the construction of a manuscript Daily Synoptic Weather Chart of the North Atlantic Ocean, showing the conditions of pressure, wind, and weather existing, as far as possible, over the entire ocean at the instant of mean noon on the meridian of Greenwich.

These charts are based almost exclusively upon the Greenwich mean noon reports returned to the Office by its voluntary meteorological observers afloat, the method of observation being fully set forth in H. O. publication No. 119, "Instructions to the Voluntary Meteorological Observers," &c., a copy of which is forwarded under separate cover.

One of the main difficulties encountered in the construction of these charts is the determination of the atmospheric pressure, the readings of the barometer recorded by the observers being in many cases unreliable, owing to the fact that the initial error of the ordinary ship's barometer is subject to frequent and considerable variation, even in the course of the brief transatlantic voyage, due, no doubt, to the rough treatment to which the instrument is necessarily exposed.

The initial error of each barometer employed in this work is ordinarily carefully determined by comparison with a standard ashore, before leaving the American port. It would, however, be of great assistance in eliminating unreliable observations if there existed at the European end some ready means of determining whether the initial error had changed materially during the course of the voyage.

It is apparent that a system of Greenwich mean noon readings of the barometer at the principal ports and coast meteorological stations of the United Kingdom, would go far towards furnishing such a means.

The U.S. Hydrographic Office has, therefore, the honour to request your co-operation in this work to the extent of furnishing the readings of the barometer at the local time corresponding to Greenwich mean noon at each of the following stations :—

Sumburgh Head.	Roche's Point.	Scilly.
Stornoway.	Liverpool.	Dungeness.
Malin Head.	Pembroke.	Jersey.
Blacksod Point.	Port Talbot.	Leith.
Valencia.		

Blank forms for recording the readings, 15 days each, will be provided by this Office. All United States Consuls are under instructions to return these forms to Washington post free.

The names of the observers to be placed on the mailing list to receive the Monthly Pilot Chart of the North Atlantic Ocean and certain other publications of this Office.

Respectfully,
W. L. BURDICK,
Lieut.-Commander, U.S. Navy,
Acting Hydrographer.

Secretary to the
Meteorological Office.

It was resolved to approach the Board of Trade with a view to establishing a system of comparison of ships' barometers in British ports, and the Secretary was directed to inform the U.S. Hydrographic Office that the Council will endeavour to arrange for the checking of ships' barometers on this side of the Atlantic.

1048. *Lectures to the Senior Officers' Class at the Royal Naval College.*—The Secretary reported that at the request of the Captain (M.O. 2,201) he had undertaken to deliver a course of four lectures on Meteorology to the Senior Officers' Class at the Royal Naval College in November next.

1049. *Publications.*—Reported—The receipt of copies of Hourly Readings, 1900—Colonial Observations I., Tropical Africa—from the Stationery Office—and of Wind Charts of the South Atlantic from the Hydrographic Office.

1050. —— Submitted for approval—Proofs of Report of International Meteorological Committee, Southport Meeting, and Report of the Council on the inquiry into London fogs; also Hourly Readings for 1901 to July.

Approved.

1051. —— *Presentation Copies.*—Read—An application from P. H. Burns, Government Superintendent of the Bahamas Cable, Nassau, an observer for the Office (M.O. 1,695), for copies of the publications of the Office.

The Secretary was directed to send the Annual Report, and to inquire whether there was any library to which publications could be sent and, if so, which publications would be desired.

An application from Monsieur A. Lancaster, Director of the Meteorological Service of Belgium, for a copy of the Annual Report and of the Pilot Charts for the Special Library of his Service, was granted (M.O. 1,309).

It was agreed that a copy of the Weekly Weather Report for the Yorkshire University of Leeds, in addition to the copy for the Observer at the University farm at Garforth, be sent as requested by Professor Seton (M.O. 2,055).

A request from Lieutenant Garrett, R.N., Divisional Officer of the coastguard at Aberdeen, for a copy of the Daily Weather Report (M.O. 2,250), was granted, and the Hydrographer was requested to ascertain whether copies of the report for Divisional Officers of the Coastguard could be distributed by the Admiralty if delivered there addressed for posting.

1052. *Crown Agents: Supply of Instruments*—(i.) *Circular to the Colonial Governments* (Minutes 1004, 1023).—Reported—The following memorandum :—

M.O. 2240.

Crown Agents for the Colonies,
Whitehall Gardens, London, S.W.,
1st October, 1904.

We forward herewith for your information a print, in duplicate, of the circular to the Colonies, respecting meteorological instruments, as finally agreed upon and despatched.

The Secretary, Meteorological Office,
63, Victoria Street, S.W.

Office of the Crown Agents for the Colonies,
Whitehall Gardens, London, S.W.,
27th September, 1904.

STORES CIRCULAR—NO. 2. METEOROLOGICAL INSTRUMENTS.

SIR,

I HAVE the honour to inform you that we have ascertained from the Meteorological Council of 63, Victoria Street, S.W., that they would be willing to supply Meteorological Instruments, upon our requisition, for the use of Colonial Governments, upon terms analogous to those upon which they are accustomed to supply observers in this Country, in connexion with the Meteorological Office. Their charge for departmental expenses in connexion with these services would be 2½ per cent. on the invoiced cost f.o.b. in an English port. This percentage does not of course cover the cost of verification at the National Physical Laboratory, Richmond. When such verification is specified in the indent and is not provided for in the price charged for the instrument, the charges of the Laboratory for verification would be added.

2. I enclose copies in duplicate of two pamphlets issued by the Meteorological Office :—

1. Hints to Meteorological observers in tropical Africa (Official No. 162).

2. Memorandum on the requirements of a normal climatological station (Circular No. 55).

In the latter of these is given a list of approximate prices of instruments as supplied to their observers in this country. These prices, however, include a commission of 5 per cent and are therefore in excess of those which we should pay under the above arrangement. The prices quoted include the cost of verification at the National Physical Laboratory in those cases in which the Council are accustomed to require such verification for their observations.

3. It will be seen from these publications that the Meteorological Office usually require, as a condition of supplying instruments, to be furnished with copies of the observations made. We are informed that while the Council would be glad to receive a transcript of the detailed observations made in the Colony in those cases in which no provision is made by the Colonial or Home Government for their publication *in extenso*, as it is in many ways convenient for a copy of such observations to be filed in this country, they do not make this a condition for the supply of instruments on the terms of this circular. Published returns are already sent to the Office in accordance with Mr. Chamberlain's circular despatch of 27th July, 1895.

4. We have already availed ourselves in some cases of the services of the Metrological Office, with results satisfactory to the Governments concerned. Should your Government desire us to employ the Meteorological Office in the execution of indents for meteorological instruments a note to that effect should appear on each indent.

5. The Meteorological Council supply, free of cost, register forms and reduction tables for observations which are intended to be returned to the Office when completed. Supplies of the same forms and tables which are not intended to be returned can be obtained in like manner at a price fixed by the Controller of His Majesty's Stationery Office, by whom they are supplied to the Meteorological Council.

6. Spare copies of this letter are attached.

I have, &c.,
M. A. CAMERON.

The Honourable
The Colonial Secretary, &c.

1052. *Crown Agents: Supply of Instruments*—(ii.) Reported—That requisitions had been received for instruments for Southern Nigeria, Gold Coast, Uganda, and the Transvaal, and that instruments were being supplied.

Approved.

1053. *Telegraphic Reports:* (i) *Lisbon.*—Read—M.O. 2280 from Mr. Harries, reporting interviews with the Superintendent at Lisbon of the Eastern Telegraph Company and his assistants, as the result of which the delivery of the Lisbon message at the Office had been accelerated by two hours, and suggesting possible further means for accelerating the messages from Portugal and Spain.

The Secretary was directed to write to the Eastern Telegraph Company asking them to thank their Superintendent at Lisbon, and to take steps to accelerate the messages as suggested by Mr. Harries. (P.C. 2,868.)

1053. —— —— (ii) *Iceland.*—In view of the reports in the newspapers to the effect that arrangements had been made by the Danish Government for the completion of a cable to the Faroe Islands and Iceland within two years, the Secretary was authorised to write to the Postmaster-General, pointing out the importance to the office of meteorological reports from Iceland, and requesting him to take steps to secure the transmission of reports by telegraph upon favourable terms.

1054. *Instruments—Admiralty Quarterly Return:—*

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 30th JUNE, 1904.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st April, 1904	65	65	52	53	29	10
	Received, new	—	8	210	—	—	25
	„ cleaned and repaired.	25	71	31	—	—	11
	Total	90	144	293	53	29	46
	Issued	35	69	120	24	22	8
	Total available 1st July, 1904.	55	75	173	29	7	38

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.
Portsmouth	25	22	—	3	55	52	—	3	150	117	—	33	50	52	2	—	50	65	15	—	25	15	—	10
†Devonport	25	17	—	8	55	38	—	17	150	132	—	18	50	44	—	6	50	44	—	6	22	16	—	6
†Chatham	25	20	—	5	55	38	—	17	150	130	—	20	50	40	—	10	50	43	—	7	25	25	—	—
†Sheerness	6	3	—	3	15	6	—	9	30	9	—	21	10	4	—	6	10	5	—	5	10	10	—	—
Queenstown	5	4	—	1	10	8	—	2	15	15	—	—	8	7	—	1	8	7	—	1	—	2	2	—
(Dockyards, Home) Totals	86	66	—	20	190	142	—	48	495	403	—	92	168	147	2	23	168	164	15	19	82	68	2	16
Gibraltar	2	3	1	—	2	6	4	—	4	2	—	2	3	1	—	2	3	2	—	1	—	—	—	—
†Malta	11	7	—	4	15	7	—	8	60	51	—	9	10	8	—	2	10	9	—	1	1	2	1	—
Bombay	4	2	—	2	3	2	—	1	10	4	—	6	4	2	—	2	4	4	—	—	1	2	1	—
Halifax	3	1	—	2	4	3	—	1	20	19	—	1	4	4	—	—	4	2	—	2	1	—	—	1
Bermuda	3	2	—	1	4	4	—	—	20	22	2	—	4	4	—	—	4	4	—	—	1	2	1	—
Jamaica	3	1	—	2	2	4	2	—	10	9	—	1	2	2	—	—	2	2	—	—	1	1	—	—
Cape of Good Hope	7	8	1	—	8	8	—	—	33	33	—	—	8	11	3	—	8	8	—	—	2	2	—	—
Trincomalee	3	1	—	2	3	2	—	1	10	6	—	4	4	5	1	—	4	3	—	1	1	1	—	—
Hong Kong	17	11	—	6	21	26	5	—	87	53	—	34	21	16	—	5	21	14	—	7	5	11	6	—
Sydney	5	4	—	1	6	4	—	2	25	14	—	11	6	9	3	—	6	11	5	—	1	1	—	—
Esquimalt	4	1	—	3	5	9	4	—	15	18	3	—	2	2	—	—	2	3	1	—	1	2	1	—
(Dockyards, Abroad) Totals	62	41	2	23	73	75	15	13	294	231	5	68	68	64	7	11	68	62	6	12	15	24	10	1
Grand Totals and Net Shortage at Depôts	148	107	—	41	263	217	—	46	789	634	—	155	236	211	—	25	236	226	—	10	97	92	—	5
At Meteorological Office ...	45	55	10	—	120	75	—	45	250	173	—	77	80	29	—	51	80	7	—	73	50	38	—	12
Repairing	—	—	28	—	—	—	22	—	—	—	—	—	—	—	52	—	—	—	55	—	—	—	—	—
Returnable from Depôts ...	—	—	27	—	—	—	55	—	—	—	19	—	—	—	26	—	—	—	29	—	—	—	—	—
Ordered	—	—	—	—	—	—	42	—	—	—	120	—	—	—	—	—	—	—	24	—	—	—	15	—
Net Surplus or Shortage at M.O.	—	—	+65	—	—	—	+74	—	—	—	+62	—	—	—	+27	—	—	—	+35	—	—	—	+ 3	—
Proposed to be Ordered ...	—	—	—	—	—	—	—	—	—	—	(132)	—	—	—	(20)	—	—	—	—	—	—	—	(10)	—

† Supplies have been sent since 30th June, 1903.

NOTE.—No change has occurred in the Stocks of Hydrometers.

Supplies to be ordered as proposed.

R. F. WALLACE.

1055. *Instruments: Aneroids* (Minute 1014).—The Secretary reported that the 50 aneroids on order had been certified at Kew with the omission of the test for "creep," and that he proposed to continue the supply of aneroids with certificates in similar form, and to compare the results as regards "creep" for instruments from a number of makers before coming to any conclusion as to the conditions to be adopted for a "creep" test.

Approved.

1056. *Storm Signals: Weston-super-Mare.*—The Secretary reported that after correspondence with the Urban District Council (M.O. 1763) he had given directions for the storm warning telegrams to be sent to Mr. F. Davey, Superintendent of the Knightstone Baths, instead of to the Piermaster, as the latter had ceased to hoist a cone.

—— *Castletown.*—Also that he had given instructions for the warning telegrams to Castletown, Isle of Man, to be discontinued as no signals had been exhibited day or night for 20 years (M.O. 2,167).

Approved.

1057. *Logs.*—Sixty-six received, three excellent (Captain J. G. Parsons, Captain A. Simpson, Captain T. F. Moffatt); also five short logs and six lighthouse registers.

1058. *Storm Warnings*:—Since July 1.

Signals hoisted on 11 days; total number of districts warned, 64.

In 19 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 25 districts by subsequent strong winds (force 7 or 6). In 20 districts they were not required.

Gales experienced without Warning.—A fresh gale from the N.E. was experienced in the western part of the channel on the night of October 2. This was caused by a small, but deep, depression which was developed off the coasts of Brittany. At 6 p.m. on the 2nd, strong winds were blowing at the mouth of the channel, but the disturbance was expected to pass away southwards without causing any further increase. The southerly movement took place rather more slowly than was anticipated, and, owing to a brisk increase of pressure over Ireland and England, the barometric gradients over the channel became rather steep. The gale was of short duration.

1059. *Harvest Forecasts*, 1904:—

SIR,

I BEG to submit, herewith, a report on the Harvest Forecast Service of 1904.

In the course of the past four months, June to September, the forecasts were sent, for varying periods of time, to 39 persons. Owing, in all probability, to the generally settled character of the weather, especially in June and July, the number of applications was much smaller than in 1903 or 1902, in each of which years the forecasts were sent to as many as 74 individuals.

Of the 39 applicants:—

1	received forecasts for	district	2, England N.E.
5	„	„	3, England, E.
9	„	„	4, Midland Counties.
10	„	„	5, England, S.
5	„	„	7, England, N.W.
8	„	„	8, England, S.W.
1	„	„	10, Ireland, S.

No applications were received from persons residing in any of the Scotch districts (Nos. 0, 1, and 6), or in Ireland, N. (No. 9).

In 25 cases the forecasts were required only for a limited time, *i.e.*, during the progress either of the hay or corn harvest, but in 12 cases they were received during the entire period covered by both. In two instances a request for the forecasts at the time of the hay harvest was followed by an application for a renewal of the service at the time of the corn harvest.

The special Saturday evening forecasts inaugurated last year with a view to giving a general idea of the weather anticipated during the whole of the two succeeding days, have this year been in increased demand. Of the total of 39 applicants no fewer than 22 requested that these special forecasts should be sent *in lieu* of the ordinary Saturday afternoon forecasts; while 6 applied for the special forecasts *in addition* to the ordinary ones.

Returns giving a daily record of the weather actually experienced during the period for which the forecasts were sent have been received from 18 persons. The results of a comparison made in the Office between the forecasts issued and the subsequent weather as entered on these returns are given in the accompanying table.

The comparison shows that, for the country as a whole, 58 per cent. of the forecasts were completely justified, and 34 per cent. partially so, 8 per cent. being classed as partial failures, *i.e.*, with less than half the details correctly given. In only one district (England, N.W.) was there even one

instance of a total failure. In 1903, only 48 per cent. of the forecasts were completely successful, and 33 per cent. partially so, 15 per cent. being classed as partial failures, and 4 per cent. as total failure. In 1902, the percentage numbers were, respectively, 51, 39, 9, and 1.

Omitting the results derived from the record of one observer in England, N.E., whose return showed a percentage of 83 completely successful, and 17 partially successful forecasts, the highest degree of success was attained in England, S., where 62 per cent. of the forecasts were completely successful, and 37 per cent. partially so. Next to this, the highest total of successes, complete and partial (94 per cent.) was reached in the Midland Counties, but of these only 47 per cent. were complete successes. In England, E., 65 per cent. were classed as completely successful.

The smallest degree of success was attained in England, N.W., where 54 per cent. were completely successful, but only an additional 35 per cent. partially so.

Appended to the table are some remarks as to the practical value of the forecasts, contributed to the Office by three of the recipients.

FREDK. J. BRODIE,
5th October, 1904.

CHECKING OF HARVEST FORECASTS, 1904.

From information supplied by the recipients.

Districts and Place.	Number checked.	A = Complete success.		B = Partial success.		C = Partial failure.		D = Total failure.	
		No.	%	No.	%	No.	%	No.	%
ENGLAND, N.E.:									
Welburn	6	5	83	1	17	—	—	—	—
For the District ...	6	5	**83**	1	**17**	—	—	—	—
ENGLAND, E.:									
Weston	77	53	69	17	22	7	9	—	—
Hoxne	27	20	74	7	26	—	—	—	—
Tolleshunt D'Arcy ...	96	55	57	31	32	10	11	—	—
Guilden Morden	7	7	100	—	—	—	—	—	—
For the District ...	207	135	**65**	55	**27**	17	**8**	—	—
MIDLAND COUNTIES:									
Wigginton	38	17	45	19	50	2	5	—	—
Highworth	7	4	57	2	29	1	14	—	—
For the District ...	45	21	**47**	21	**47**	—	**6**	—	—
ENGLAND, S.:									
Lower Edmonton	7	2	29	5	71	—	—	—	—
Staplehurst	63	41	65	22	35	—	—	—	—
Reigate	12	7	59	4	33	1	—	—	—
Chiddingfold	17	9	53	7	41	1	—	—	—
Bradfield	7	6	86	1	14	—	—	—	—
Yeovil	14	9	64	5	36	—	—	—	—
For the District ...	120	74	**62**	44	**37**	2	**1**	—	—
ENGLAND, N.W.:									
Portmadoc	118	64	54	41	35	12	10	1	1
Llandudno	114	61	53	41	36	11	10	1	1
For the District ...	232	125	**54**	82	**35**	23	**10**	2	**1**
ENGLAND, S.W.:									
Llanwern	21	15	71	6	29	—	—	—	—
Tregony	19	10	53	7	37	2	10	—	—
Broadclyst	94	50	53	36	38	8	9	—	—
For the District ...	134	75	**56**	49	**37**	10	**7**	—	—
Results for all Districts	744	435	**58**	252	**34**	55	**8**	2	**0**

Captain Stone, Havering, writes with regard to the forecasts:—"They have been very correct with the exception of rain. It has looked threatening occasionally, but none has fallen."

Mr. Coker, Wigginton, writes;—"Have found them extremely useful."

Mr. Thompson, Welburn, writes:—"Forecasts supplied by you fully verified and much appreciated."

1060. *Forecasts.*—Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of June, 1904 :—

The letters used have the following signification :—
a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	77	67	72	94
"	b	17	27	22	
"	c	6	3	5	
"	d	0	3	1	
Scotland, E.	a	67	57	62	96
"	b	30	37	34	
"	c	3	6	4	
"	d	0	0	0	
England, N.E.	a	64	60	62	96
"	b	33	34	34	
"	c	3	3	3	
"	d	0	3	1	
England, E.	a	53	67	60	94
"	b	37	30	34	
"	c	7	3	5	
"	d	3	0	1	
Midland Counties	a	57	70	64	97
"	b	40	27	33	
"	c	3	3	3	
"	d	0	0	0	
England, S.	a	57	47	52	94
"	b	37	47	42	
"	c	6	6	6	
"	d	0	0	0	
Scotland, W.	a	53	77	65	92
"	b	30	23	27	
"	c	17	0	8	
"	d	0	0	0	
England, N.W.	a	54	60	57	94
"	b	33	40	37	
"	c	13	0	6	
"	d	0	0	0	
England, S.W.	a	23	60	42	77
"	b	43	27	35	
"	c	27	7	17	
"	d	7	6	6	
Ireland, N.	a	43	67	55	90
"	b	40	30	35	
"	c	17	3	10	
"	d	0	0	0	
Ireland, S.	a	37	64	51	82
"	b	40	23	31	
"	c	20	10	15	
"	d	3	3	3	
Summary.					
British Islands	a	53	63	58	92
"	b	35	32	34	
"	c	11	4	7	
"	d	1	1	1	

1060. *Forecasts* for July, 1904 :—

The letters used have the following signification :—
a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	52	55	54	87
,,	b	35	32	33	
,,	c	13	10	12	
,,	d	0	3	1	
Scotland, E.	a	65	55	60	97
,,	b	32	42	37	
,,	c	3	0	2	
,,	d	0	3	1	
England, N.E.	a	78	68	73	94
,,	b	19	23	21	
,,	c	3	6	5	
,,	d	0	3	1	
England, E.	a	58	71	65	84
,,	b	26	13	19	
,,	c	13	13	13	
,,	d	3	3	3	
Midland Counties	a	68	81	75	91
,,	b	29	3	16	
,,	c	3	13	8	
,,	d	0	3	1	
England, S.	a	81	78	80	89
,,	b	13	6	9	
,,	c	6	13	10	
,,	d	0	3	1	
Scotland, W.	a	48	49	49	83
,,	b	23	45	34	
,,	c	29	6	17	
,,	d	0	0	0	
England, N.W.	a	68	61	65	87
,,	b	19	26	22	
,,	c	10	13	12	
,,	d	3	0	1	
England, S.W.	a	61	68	65	94
,,	b	32	26	29	
,,	c	7	6	6	
,,	d	0	0	0	
Ireland, N.	a	45	68	57	86
,,	b	29	29	29	
,,	c	23	3	13	
,,	d	3	0	1	
Ireland, S.	a	65	61	63	81
,,	b	10	26	18	
,,	c	16	7	12	
,,	d	9	6	7	
Summary.					
British Islands	a	63	65	64	89
,,	b	24	25	25	
,,	c	11	8	9	
,,	d	2	2	2	

1060. *Forecasts* for August, 1904 :—

The letters used have the following signification :
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	35	65	50	83
,,	b	39	26	33	
,,	c	16	6	11	
,,	d	10	3	6	
Scotland, E.	a	35	71	53	86
,,	b	39	26	33	
,,	c	23	0	11	
,,	d	3	3	3	
England, N.E.	a	42	74	58	94
,,	b	49	23	36	
,,	c	6	3	5	
,,	d	3	0	1	
England, E.	a	45	65	55	89
,,	b	39	29	34	
,,	c	13	6	10	
,,	d	3	0	1	
Midland Counties	a	45	61	53	92
,,	b	45	32	39	
,,	c	10	7	8	
,,	d	0	0	0	
England, S.	a	55	58	57	96
,,	b	39	39	39	
,,	c	6	3	4	
,,	d	0	0	0	
Scotland, W.	a	29	71	50	87
,,	b	45	29	37	
,,	c	26	0	13	
,,	d	0	0	0	
England, N.W.	a	39	74	57	86
,,	b	35	23	29	
,,	c	26	3	14	
,,	d	0	0	0	
England, S.W.	a	39	65	52	88
,,	b	42	29	36	
,,	c	13	0	6	
,,	d	6	6	6	
Ireland, N.	a	29	68	49	81
,,	b	39	26	32	
,,	c	29	3	16	
,,	d	3	3	3	
Ireland, S.	a	26	61	44	75
,,	b	39	23	31	
,,	c	29	13	21	
,,	d	6	3	4	
Summary					
British Islands	a	38	66	52	87
,,	b	41	28	35	
,,	c	18	4	11	
,,	d	3	2	2	

1061. *Office Staff.*—The Secretary reported that in consequence of illness he had sanctioned the employment of Mr. Bracey and Mr. Pycock for two hours per day overtime from 20th September for the preparation of the monthly reports and the Registrar-General's current quarterly return at a cost of £6 4*s.* 10*d.*

Also that he had allowed Miss B. Smith to prepare, in overtime, from the annual summaries of the Weekly Weather Report, a tabular statement of the variation of the seasons in England, N.W., for Mr. Money Wigram with a view to his evidence before the Royal Commission on grouse disease, Mr. Money Wigram having undertaken to pay the cost of the compilation (M.O. 2,170).

Approved.

1062. *Accounts: Annual Audit.*—Reported—That the Office Accounts for the year ended 31st March, 1904, had been audited on 23rd and 24th August by the Exchequer and Audit Department.

—— The account against the Admiralty for the marine barometers for the Osborne Naval Cadets Establishment (M.O. 2,364) was ordered to be written off.

—— Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 30th June	944	10	2
Receipts from 1st July to 4th October	3,792	18	3
	4,737	8	5
Cheques drawn from 1st July to 4th October ...	3,457	8	9
Cash balance on 4th October	£1,279	19	8

1063. *Reports of Work* for July, August, and September were submitted and approved.

1064. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 19th October*, 1904.

PRESENT:

SIR R. STRACHEY (IN THE CHAIR).

PROFESSOR DARWIN. | CAPTAIN FIELD, *Hydrographer.*

MR. SHAW (*Secretary*).

1065. The minutes (1040–1064) of the last meeting, 5th October, were read and confirmed.

1066. *Retirement of Sir W. Wharton* (Minute 1041).—Read—The following letter:—

Florys, Princes Road,
Wimbledon Park,
10th October, 1904.

DEAR SHAW,

I AM greatly touched by the terms of the Resolution of the Meteorological Council, which they have been so good as to pass and communicate to me. Pray thank the other Members, and tell them how much I value it, though no one can feel more strongly than I do that it expresses a higher value than anything I have been able to do, in the little time left by the overpowering work of the Hydrographic Office deserves. I shall observe the future fate of the Office with much interest.

Yours sincerely,
W. J. L. WHARTON.

It was ordered that the letter be printed in the minutes.

1067. *Admiral FitzRoy.*—The Secretary reported that Miss Laura FitzRoy, daughter of the late Admiral FitzRoy, had presented to the Office a portrait of her father, and that, at Miss FitzRoy's request, Mr. R. H. Scott had also presented a portrait.

It was resolved that the thanks of the Council be conveyed to the donors.

1068. *Annual Report.*—The Secretary reported that the report for 1903–4 had been signed (Minute 1021) and sent to the Royal Society for presentation to Parliament.

1069. *Constitution of the Council* (Minute 1043).—Professor Darwin having ascertained that the Royal Society would be glad to receive an expression of opinion by the Council, a memorandum upon the questions raised in the Treasury letter, drawn up by the Chairman, was considered, amended, and approved.

The Secretary was directed to forward a copy to the Royal Society.

1070. *Antarctic Expeditions.*—The Secretary reported that a meeting of the Committee appointed by the Royal Society to co-operate with the Council (Minute 1045) in the reduction and discussion of the observations in connexion with the National Antarctic Expedition had been held at the Office on Thursday, October 13th, at which Dr. Chree, Mr. H. N. Dickson, Mr. W. H. Dines, Dr. A. J. Herbertson, Professor Larmor (Secretary of the Royal Society), Captain Tizard, Mr. C. T. R. Wilson, the Hydrographer, and the Secretary were present. Lieutenant C. Royds, R.N., of the "Discovery," was present by invitation.

As the result of the meeting the Secretary submitted the following report :—

THE METEOROLOGY OF THE ANTARCTIC.

The material already in possession of the Office is as follows :—

I.—Observations of the "Discovery" Expedition.

a. The Meteorological Register of the "Discovery" comprising two-hourly readings from November 29th, 1901 to December 10th, 1903, thereafter day observations only, with supplementary observations, remarks, &c. Also daily observations of temperature at Cape Armitage.

b. Meteorological Registers kept on siedge journeys which should be brought into comparison with those of the base station.

The traces of the following self-recording instruments :—

Barograph.—From December 2nd, 1901, till March 28th, 1904, complete, generally in duplicate.

Thermograph.—From December 2nd, 1901, till February 29th, 1904, complete, generally in duplicate.

Hydrograph.—Nearly complete, sometimes in duplicate, but the traces are often not satisfactory.

Sunshine Recorder.—Some days missing.

Dines' Anemograph.—Incomplete and of doubtful value.

II.—Auxiliary Observations.

a. Land Observations.—Daily readings from the following countries are received at the Office in the ordinary course. Those received up to the present time supply data for positions south of 30° South as follows :—

1. *South America.—Argentine Republic.*—Daily weather charts are available from February, 1902. Observations for the previous months could probably be obtained on application.

2. *Australia.—Perth.*—To the end of 1902.

—— *Sydney.*—Daily weather reports (9 a.m.) for Australia and New Zealand up to the end of 1902 have been received.

3. *New Zealand.—Wellington.*—Daily readings (9.30 a.m.) up to April, 1904.

4. *Falkland Isles.—Cape Pembroke.*—The usual four-hourly observations of a lighthouse register come to the Office regularly. Records of pressure, sunshine, and other observations have been made at the Falklands for the Scottish Antarctic Expedition. Sunshine cards from January 23rd, 1903, to March 31st, 1904, have been received at the Office.

In response to the request of the International Antarctic Committee, through the Foreign and Colonial Offices, and of the Royal Society, addressed to the Colonial Observatories, &c., south of 30° S., a bundle of traces of self-recording instruments has been received from Sydney, and an international register from the Cape Observatory. A similar register has also arrived from Mauritius.

b. MARINE OBSERVATIONS.—The following are available :—

1. *International Co-operation.*—Special observations at noon, G.M.T., south of 30° S. 16,600 readings between October 1st, 1901, and March 31st, 1904.

2. *Ordinary Office Logs.*—Four-hourly observations giving 8,400 days' readings between October 1st, 1901, and March 31st, 1904.

EXCHANGE OF OBSERVATIONS WITH THOSE OF OTHER ORGANISATIONS.

The special auxiliary observations are part of an international co-operation, and information from all sources should be compiled, either by exchange of copies or otherwise, before the issue of any publication representing the results. In addition to possible marine observations the German expedition has the observations of the station at Kerguelen, which alone would be an important addition to the available material. In this matter the Royal Society contemplate procedure by international co-operation.

The co-operation of the British authorities was asked for by Professor von Drygalski when he was in England, but no further communication has taken place on the subject.

Copies have been applied for, of the Falkland Isles observations for the years 1902 and 1903 by the Colonial Office for the Swedish expedition, and for 1903 and 1904 for the Scottish expedition by Mr. Bruce.

It is proposed (1) to prepare a series of tables of the "Discovery" observations, reducing the pressure readings to 32° F. and sea level, in a form similar in its general scheme to that adopted for the publication of the "Challenger" observations. A specimen of the form is appended hereto. The daily observations if printed in this form would occupy about 150 pp. 4to. A separate form would be required for the sledge journeys.

(2) To prepare special notes or memoirs upon such subjects as the following :—

i. Instruments—general notes.

ii. Spirit minimum and mercury minimum readings.

iii. Open air temperature and screen temperature (Terrestrial Radiation).

iv. Aspiration psychrometer readings, the wet and dry bulb readings, and observations on evaporation.

v. Sequence of weather changes. In this the results of the self-recording instruments would be dealt with.

vi. Wind measurements and Dines' recorder.

vii. The climatology of Victoria land for the two years, based on the observations at winter quarters and sledge journeys. For this the observations of the "Morning" and the "Terra Nova" should be incorporated with those of the "Discovery."

The above should be published as soon as they are ready.

It is further proposed (3) to tabulate the auxiliary observations for each day on a separate sheet with a map in the margin, upon which the positions of the land stations and observing ships would be marked (specimen submitted). These observations would be supplemented by those received from the Colonies or foreign countries. From the complete data daily maps would be prepared in manuscript, the publication of which as illustrating a paper on the general meteorology of the Antarctic during the years 1902–1903 would be a subject for subsequent consideration.

In order to come to an understanding with regard to the exchange of observations and their reduction upon a common system it is desirable that the Secretary should place himself in communication with the authorities of the Scottish, German, Swedish, and Norwegian expeditions.

Professor Larmor undertook on behalf of the Royal Society to invite a representative of the Scottish expedition to join the Committee.

The Secretary was authorised to place himself in communication with the authorities of the Expeditions enumerated in the report with the view of securing an exchange of auxiliary observations, and of arranging for a common scheme of publication.

(*Specimen.*)

"DISCOVERY" STATION: LAT. 77° 49′ S.; LONG. 166° 30′ E.

22nd September, 1902.

Hour.	Barometer reduced to 32° F.	Thermometer. Cape Armitage.	Thermometer. Spirit Min.	Thermometer. Mercurial. Dry Bulb.	Thermometer. Mercurial. Wet Bulb.	Humidity.	Wind. Direction.	Wind. Beaufort. Force.	Wind. Robinson. Miles Run.	Wind. Dines. Miles per Hour.	Weather.	Sunshine.	Clouds; Movement and Amount. Upper.	Clouds; Movement and Amount. Lower.	Miscellaneous Phenomena.	Wind Direction by Erebus' Smoke.	Remarks.
2	29·376		−25·0	−23·0	−22·8	100	E.	4–5	47·1	28–20	b		—	—			
4	29·374	[−46·8]	−26·8	−21·8	−21·5	100	E.	1–2	36·0	10–15	b		—	—			4 a.m.—Daylight.
6	29·386		−24·8	−23·2	−23·0	100	E.S.E.	1	30·2	5–7	bc		Cir. Str. 6	—	Ξ		Faint Aurora, N. to S.
8	29·390		−37·9	−29·8	−30·0	90	Light E^{ly} Airs.		0	0	b		—	—			
10	29·448		−31·8	−23·0	−23·0	100	Calm	0	5·0	0	b		—	—			Much Mirage all round horizon, and not far away.
Noon	29·476	−35·6	−25·0	−19·0	−18·5	100	Calm	0	13·2	0	bc		Cir. Str. 4	—		S.W.	Erebus' Smoke going N.E. Some stratus below summit.
2	29·478		−23·2	−17·0	−17·0	100	Light N.E^{ly} Airs.		0·9	0	bc		Cir. Str. 4	—			Upper half of Terror obscured.
4	29·506		−22·5	−20·0	−20·0	100	Calm	0	5·4	0	bc		Cir. Str. 4	—			Mirage all round.
6	29·528		−23·0	−18·0	−17·8	100	Calm	0	0·7	0	0c		Cir. Str. 6	—			Western hills covered with low stratus.
8	29·536		−19·0	−16·0	−16·2	90	E.	1–2	11·4	5–10	0		—	Str. 9			Fine with striking Cir. Str. clouds; wind rising in evening.
10	29·566		−22·0	−20·5	−20·5	100	E. by S.	4–5	36·3	30–35	bc		Alt. Str. 4	—			
Midt.	29·552		−23·0	−20·0	−20·0	100	E.	3–4	47·1	25–33	0		—	Str. 10			A few stars visible in zenith.
	29·468		−37·9	−20·9	−20·9	96	—	—	19·4	—	—	—	—	—	—	—	

Maximum Temperature { 8 a.m. −18·9; 8 p.m. −14·8 }

Evaporation, 89·84. Precipitation, —

Solar Radiation { Black bulb, 49·5°; Bright bulb, 8·4° }

1071. *Publications: Barometer Manual.*—Read—M.O. 2,259 from the Stationery Office stating that another edition of the Manual was called for.

The Secretary was directed to prepare a revised edition.

1072. *Irish Coast Fishing Industry.*—Read—The following letter:—

M.O. 2,355.

Town Commissioners' Office,
Kilkee, Co. Clare,
17th October, 1904.

SIR,

ON behalf of a large proportion of the population of this important township who are engaged in the fishing industry, I beg to ask your honourable Council if the Meteorological Office would supply, free of charge, information as to probable weather here, at intervals. I need hardly state that the coast here is a most dangerous one, and our poor fishermen are precluded from plying their calling for weeks at a time, and must take advantage of every propitious interval, depending solely on their own judgment as to the kind of weather to be anticipated. A reply will oblige.

Your obedient Servant,
PATRICK KEANE,
Town Clerk.

The Secretary,
Meteorological Office, London.

The Secretary was directed to communicate with the Irish Board of Agriculture and Technical Industries.

1073. *Instruments: Mercantile Marine:*—

RETURN OF AVAILABLE INSTRUMENTS AT AGENCIES AND AT M.O. FOR SIX MONTHS ENDING 15TH SEPTEMBER, 1904.

Agency.	Barometers.				Thermometers.				Hydrometers.				Screens.			
	Est.	Store.	+	—	Est.	Store.	+	—	Est.	Store.	+	—	Est.	Store.	+	—
Cardiff	6	2	—	4	36	22	—	14	24	13	—	11	6	3	—	3
Dundee	6	2	—	4	36	2	—	34	24	6	—	18	6	—	—	6
Glasgow	6	10	4	—	36	34	—	2	24	37	13	—	6	7	1	—
Hull	3	4	1	—	18	16	—	2	12	14	2	—	3	4	1	—
Liverpool	6	7	1	—	36	15	—	21	24	9	—	15	6	7	1	—
Southampton ...	6	3	—	3	36	18	—	18	24	1	—	23	6	5	—	1
Sunderland	4	2	—	2	24	18	—	6	16	12	—	4	4	3	—	1
Totals ...	37	30	6	13	222	125	—	97	148	92	15	71	37	29	3	11
Net shortages ...	—	—	—	7	—	—	—	97	—	—	—	56	—	—	—	8
Meteorological Office	20	3	—	17	120	46	—	74	80	41	—	39	20	3	—	17
Repairing ...	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Returnable ...	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—
Ordered ...	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—
Net surplus or shortage.	—	—	+ —	— 3	—	—	+ —	— 74	—	—	+ —	— 39	—	—	+ —	— 17
Proposed to be ordered	—	—	(—)	—	—	—	(174)	—	—	—	(100)	—	—	—	(20)	—

19th October, 1904.

R. F. WALLACE.

The Secretary was directed to report upon the expenditure on instruments for the Mercantile Marine.

1074. *Instruments.*—Reported—The breakage of two mercury barometers and one aneroid in transmission to Bermuda, with a note by the Director of Transports upon the occurrence (M.O. 2,128).

The Secretary was directed to make a return of the number of instruments broken in transmission in relation to the number sent out.

1075. *Logs.*—Twelve received, three excellent (Capt. A. L. Paterson, Capt. J. W. Millican, Capt. G. S. Webster).

1076. *Storm Warnings:*—

Signals hoisted on 7 days; total number of districts warned, 35.

In 20 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 6 districts by subsequent strong winds (force 7 or 6). In 9 districts they were not required.

Gales experienced for which no Warnings were issued.—None.

F. J. BRODIE.

1077. *Forecasts.*—Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of September, 1904 :—

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	67	73	70	90
,,	b	20	20	20	
,,	c	13	7	10	
,,	d	0	0	0	
Scotland, E.	a	50	90	70	94
,,	b	37	10	24	
,,	c	13	0	6	
,,	d	0	0	0	
England, N.E.	a	60	70	65	92
,,	b	27	27	27	
,,	c	10	3	7	
,,	d	3	0	1	
England, E.	a	63	70	67	92
,,	b	30	20	25	
,,	c	0	10	5	
,,	d	7	0	3	
Midland Counties	a	53	50	52	90
,,	b	30	47	38	
,,	c	7	3	5	
,,	d	10	0	5	
England, S.	a	67	60	64	92
,,	b	23	33	28	
,,	c	7	7	7	
,,	d	3	0	1	
Scotland, W.	a	57	77	67	81
,,	b	7	20	14	
,,	c	26	3	14	
,,	d	10	0	5	
England, N.W.	a	63	84	74	87
,,	b	13	13	13	
,,	c	17	3	10	
,,	d	7	0	3	
England, S.W.	a	67	73	70	89
,,	b	13	24	19	
,,	c	20	3	11	
,,	d	0	0	0	
Ireland, N.	a	47	70	59	86
,,	b	30	24	27	
,,	c	20	3	11	
,,	d	3	3	3	
Ireland, S.	a	40	70	55	82
,,	b	33	20	27	
,,	c	20	10	15	
,,	d	7	0	3	
Summary.					
British Islands	a	58	72	65	89
,,	b	24	23	24	
,,	c	14	5	9	
,,	d	4	0	2	

1078. *Accounts.*—Submitted—The following statement :—

	£	s.	d.
Cash balance on 4th October...	1,279	19	8
Receipts from 4th to 18th October	3,628	15	5
	4,908	15	1
Cheques drawn from 4th to 18th October	68	11	4
Cash balance on 18th October	4,840	3	9

1079. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 2nd November*, 1904.

PRESENT :

PROFESSOR DARWIN, IN THE CHAIR.

MR. BUCHAN. | CAPTAIN FIELD, *Hydrographer.*

MR. SHAW (*Secretary*).

1080. The Minutes (1065-1079) of the last meeting (19th October) were read and confirmed.

1081. *New Members of Council.*—Read—The following letter :—

M.O. 2,489.

Burlington House,
London, W.
November 1st, 1904.

DEAR SIR,

I AM directed to inform you that the Council of the Royal Society at their meeting on Thursday last appointed Mr. W. H. Dines, Professor A. Schuster, F.R.S., and Sir John Eliot, K.C.I.E., F.R.S., to serve on the Meteorological Council, to fill the offices which fell vacant on March 31st last.

I am, &c.,
ROBERT HARRISON,
Assist. Sec. R.S.

Dr. W. N. Shaw, F.R.S.,
Secretary to the Meteorological Council.

1082. *Telegraphic Reports, Lisbon* (Minute 1053).—Read—M.O. 2433 from the Eastern Telegraph Company, expressing the willingness of the Company "to render the meteorological messages as serviceable as possible."

1083. *Antarctic Co-operation* (Minute 1045).—Read—Letter M.O. 2400 from Professor von Drygalski, requesting information respecting the method to be agreed upon for co-operation with regard to the Antarctic observations.

The Secretary was authorised to forward a copy of the Report contained in Minute 1070 with a covering letter.

1084. *Station in St. James's Park* (Minute 1031).—The Secretary reported that the arrangements for the exhibition of door-board charts and forecasts, together with records of sunshine, rainfall and temperature, would be completed as soon as the Halliwell rain gauge had been fixed, and provision made for sending the documents to the screens ; also that the screen and rain gauges were to be set up in the park on Friday, the 4th of November, and that exhibition of records, &c., was to commence on Monday, the 7th of November.

The Secretary was authorised to make provisional arrangements for the exhibition of the records, and the daily observations corresponding to a Telegraphic Reporting Station, and report the arrangements for approval at the next meeting.

1085. *International Telegraphic Service, Bergen.*—Read—M.O. 2357 from Mr. M. J. Föyn, requesting occasional special 2 p.m. reports from Stornoway, Blacksod and Dunrossness, upon receipt of a reply-paid telegraphic message addressed to the respective observers.

The Secretary was directed to suggest that the reply-paid telegram of inquiry should be addressed to London, and that if the Central Telegraph Office is willing to undertake the duty, the reply-messages should be extracted at the Central Telegraph Office from those in course of transmission to the Office for the 2 p.m. map; that, failing this arrangement, the inquiries should be addressed to the Office and replied to therefrom.

1086.—*Publications* (i.) *Stationery Office Estimate for* 1905-6 (M.O. 2241).—It was resolved to include provision for the publication within the year 1905–6 of the following:—

Daily weather report.
Weekly weather report, with monthly and annual summaries, and occasional supplements.
Hourly readings (two volumes).
Second order stations (one volume).
Colonial volume.
Report of wind inquiry.
Report of St. Helena inquiry.
Report of special investigations—trajectories of air, and forecast-districts inquiry.
Reprint of O. 123 (Minute 975).

Also to refer in the estimate to the proposal to publish the meteorological results of the Antarctic expedition.

—— —— (ii.) Submitted—Preface and introduction of the volume of Hourly Readings, 1901 (33rd year, new series, volume II.).

Approved.

—— —— (iii.) Submitted—Two specimens of binding of the Reproduction of O. 59 (Minute 792).

The Secretary was directed to ascertain whether it would be possible to replace the charts of the Indian Ocean temperatures by reprints on the same size paper as the title page; subject to the suggested alteration, the binding was approved.

—— —— (iv.) *Wind Charts of the South Atlantic.*—It was agreed that the Secretary report further upon a proposal to issue the paper (Minute 995) read before the British Association at Cambridge by the Marine Superintendent, upon the winds, &c., of the South Atlantic, as a separate publication.

—— —— (v.) It was agreed to requisition as official copies the remaining stock at the Stationery Office of O. 106, "Meteorological Charts of the Red Sea" (25 copies) and of O. 92, "Meteorological Charts of the Indian Ocean adjacent to Cape Guardafui."

1087. *Colonial Observations:* (i) *St. Helena* (Minute 1026).—It was resolved that the recording part of the anemometer which had been sent home for inspection be cleaned and put in order, that the brass pencils be replaced by silver ones, and that the instrument be then returned to St. Helena.

1088. *Foreign Observations: Congo.*—Read—An application from the Rev. S. O. Kempton for the loan of instruments (M.O. 2333).

The Secretary was directed to express the regret of the Council at their inability to comply with this request.

1089. *Instruments: Mercantile Marine* (Minute 1073).—Submitted—The following report.

MERCANTILE MARINE.

Return showing the number of Ships supplied and Logs received, the amount expended on New Instruments, Repairs, and Agents, Fees, &c.

Period—April 1899 to September 1904.	Agencies.																Expenditure.			
	Cardiff.		Dundee.		Glasgow.		Hull.		Liverpool.		Southampton.		Sunderland.		M. O.		Totals.		Instruments.		Agents' Fees, &c.	Totals.
	Ships supplied.	Logs received.	Ships supplied.	Logs received.	Ships supplied.	Logs received.	Ships supplied.	Logs received.	Ships supplied.	Logs received.	Ships supplied.	Logs received.	Ships supplied.	Logs received.	Ships supplied.	Logs received.	Ships supplied.	Logs received.	New.	Repairs.		
																			£ s. d.	£ s. d.	£ s. d.	£ s. d.
1899-1900... ...	4	4	4	4	11	19	2	1	21	15	20	17	—	—	34	95	96	155	36 0 0	33 1 0	77 0 0	146 1 0
1900-1901... ...	1	1	5	1	15	11	1	—	13	14	27	14	—	—	21	79	83	120	37 16 0	24 15 6	64 18 6	127 10 0
1901-1902... ...	19	2	—	—	14	10	1	—	4	14	20	12	Commenced March, 1903.		40	90	98	128	36 15 9	26 4 3	57 8 11	120 8 11
1902-1903... ...	34	2	21	1	16	20	4	—	3	10	22	13	—	—	40	131	140	177	154 19 3	79 19 6	81 13 1	316 11 10
1903-1904... ...	24	10	12	4	7	15	4	—	21	11	34	19	3	1	48	117	153	177	56 14 5	61 17 9	102 5 4	220 17 6
1904 (April-Sept.)	18	9	3	—	6	8	—	—	17	10	10	11	1	—	62	77	117	115	141 0 5	12 13 9	49 9 3	203 3 5
Totals ...	100	28	45	10	69	83	12	1	79	74	133	86	4	1	245	589	687	872	£463 5 10	238 11 9	432 15 1	1,134 12 8

2nd November, 1904.

1090. *Instruments: Breakages in Transit* (Minute 1074) :—

RETURN OF BREAKAGES IN TRANSIT OF BAROMETERS IN RELATION TO THE NUMBER SENT OUT.

Period—April 1899 to September 1904.	Admiralty.																	Mercantile Marine.							
	Home Dockyards.						Foreign Dockyards.											Agencies.							
	Portsmouth.	Devonport.	Chatham.	Queenstown.	Sheerness.	Total.	Gibraltar.	Malta.	Bombay.	Halifax.	Bermuda.	Jamaica.	Cape of Good Hope.	Trincomalee.	Hong-Kong.	Sydney.	Esquimalt.	Total.	Cardiff.	Dundee.	Glasgow.	Hull.	Liverpool.	Southampton.	Sunderland.	Total.
Sent out..	62	125	110	31	7	335	4	43	2	6	17	1	36	0	40	24	8	181	24	27	20	2	40	18	4	135
Broken in transit	**3**	**2**	*Nil*	*Nil*	*Nil*	**5**	*Nil*	**6**	*Nil*	*Nil*	**2**	*Nil*	**14**	*Nil*	**1**	**3**	*Nil*	**26**	*Nil*	*Nil*	**3**	**2**	*Nil*	*Nil*	**1**	**6**

2nd November, 1904.

1091. *Storm Signal Stations.*—Read—M.O. 2336 from Mr. Hipwood of the Board of Trade respecting an application by Colonel Lucas, M.P., for the establishment of a storm signal station at Lowestoft.

The Secretary reported that he had supplied the necessary information to Colonel Lucas (P.C. 2948), and had intimated that the Council would be willing to send the telegrams to Lowestoft upon the usual terms.

Approved.

1092. *Fishery Barometer Stations.*—Read—M.O. 2435 from Patrick Buckley, Station Officer of the Coast Guard, Ballycrovane, asking for a fishery barometer for Kilmacollogue Harbour at the entrance of the Kenmare River, County Kerry.

The Secretary suggested that for the fishing communities on the West Coast of Ireland an aneroidograph might be more serviceable than a barometer of the fishery pattern.

It was agreed to consult the Board of Agriculture and Technical Instruction for Ireland with reference to the matter.

1093. *Telegrams for the Admiralty.*—Read—M.O. 2434 from the Post Office respecting certain telegrams sent to the Captain-Superintendent, Pembroke Dockyard, in connexion with the cruises of the destroyer flotillas (Minute 759), and charged against the Office account.

The Secretary reported that the cost of forecast telegrams to H.M. yacht and to the Superintendents of H.M. Dockyards were still charged for in the Post Office account.

It was agreed that steps be taken to obtain authority for all warning and forecast telegrams sent to H.M. Ships and Dockyards to be sent as service messages.

1094. *Climatological Information for the Admiralty.*—Read—M.O. 2347 from the Hydrographer asking for climatological summaries for stations in British Columbia for a revised edition of the Sailing Directions.

Approved.

1095. *Logs.*—Ten received, none excellent. One short register.

1096. *Storm warnings.*—None issued. No gales.

1097. *Inspections.*—Submitted the following reports by inspectors :—

The Inspectors for 1904 were as follows :—

Observatories and Anemograph Stations ... Mr. T. W. Baker and Mr. E. G. Constable, by arrangement with the Director of the National Physical Laboratory, Mr. R. H. Curtis, and Mr. J. A. Curtis.

Districts 0, 1 and part of 6 ... ... Dr. A. Buchan.
„ 2 and part of 4 ... ... Mr. J. A. Curtis.
„ 3 ... ... Mr. H. Harries.
„ 5 ... ... Mr. R. G. K. Lempfert and Mr. W. Marriott.
„ 7 and part of 6 ... ... Mr. F. J. Brodie and Mr. W. Marriott.
„ 8 „ „ 4 ... ... Mr. R. H. Curtis and Mr. W. Marriott.
„ 9 and 10 ... ... Capt. C. Hepworth.

The stations visited have been classed by the Inspectors as

Excellent ... ... (α),
Very good ... ... (β),
Good ... ... (γ), or
Unsatisfactory ... (δ), and

the letters which indicate the various classes are inserted against the names of the stations in the following Index.

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* New Station since 31st March, 1903. † Station discontinued
‡ Information received weekly for use in the Weekly Weather Reports.
M Information for Stations marked "M" is supplied by the Royal Meteorological Society.
§ „ „ „ "§" „ „ Scottish „ „

GROUP A.—OBSERVATORIES.

Aberdeen, October 3rd–5th.—Here the self-recording instruments were found to be in good order, and are evidently carefully attended to.

I first dismounted the thermograph, cleaned the clock and lenses, and afterwards shifted the dots from the summer to the winter position. The barograph clock was also cleaned as well as the lens and condenser.

On dismounting the anemometer, the oil in the direction well was found quite limpid, while the other parts of the instrument were lubricated in a satisfactory manner. After cleaning out the old oil the different bearings were supplied with fresh sperm oil.

The orientation was duly tested and found correct.

The rain-gauge was taken to pieces and cleaned, and "squeezes" obtained of both the self-recording and spare funnels. As regards the spare gauge, the tube from the funnel to the receiver was found unsoldered; this I had put right.

The screw of the stop which is used for regulating the pen to the zero line of the Beckley gauge was accidentally broken off at the time of inspection; this was duly repaired, and at the same time a missing screw was replaced by a new one for keeping the clock spindle in position.

The card table used for reducing the barometer readings to 32° Faht. is literally worn out, and the observer would be glad to have a new table; also, a glass measure is needed for the self-recording gauge. The thermometers were tested in the usual manner.

T. W. B.

Armagh, August 17th–18th.—The Robinson anemograph and the Beckley rain-gauge appeared to be satisfactory.

Each instrument and clock was cleaned.

The oil for the direction-roller bearings was fluid, but dirty; new sperm was used.

Orientation was satisfactory.

There is again need of a further topping of the many trees surrounding this station; the anemometer is much shut in, especially from, say, S.W. to N.

I left a special pen and ink for the rain-gauge.

E. G. C.

Ben Nevis, August 26th.—Two observers, recently added to the Ben Nevis staff, made the observations and did the deductions expertly and correctly.

A. B.

Falmouth, August 31st.—The self-recording instruments here are apparently well looked after.

Each instrument, with clock, &c., was overhauled and cleaned.

The cup bearing on the velocity spindle was loose: I had a new pin fixed and base of cup soldered, and it is now firm again.

In taking down the barograph "temperature-bar," which was necessary, as the knife-edge and plane bearing had become dirty, the plate end of the glass rod was accidentally damaged.

This was repaired, but it will probably cause an alteration in the barograph residual correction.

E. G. C.

Falmouth, July 19th–20th.—*Pressure Tube Anemometer.*—I found the water-level in the tank a trifle high, but generally the instrument was in good order and clean. The pen was not properly set, and in one or two other details alterations were made, resulting in a steadier and much cleaner trace.

The water was clean, but a slight amount of corrosion was going on in the joints of the float. Fresh water was supplied after the float and tank had been thoroughly cleaned. Tested by the gauge the record was slightly high throughout the scale before anything had been done to the instrument; after cleaning and re-adjustment of water level and weights the gauge test was satisfactory. The vane was taken down by means of a rod; but a ladder was then raised against the mast, and the upper part of the head was cleaned, the holes of the suction pipe examined, and when the vane was replaced it worked very satisfactorily.

Although the record was too high it was less so than I had expected to find it. The lower wind forces were exaggerated owing to the float having been too light, and a good many shot had to be added to it to bring it properly to zero. The higher forces would not, however, be affected by this, and I think from what I saw of the instrument that at velocities of, say, forty miles and upwards the record was not far from correct, and may be safely accepted. There was a strong wind whilst I was there, and the hut vibrated a good deal. I showed Mr. Venson that by tilting the pen the "shaky trace" of which he complained could be prevented, and the subsequent records have certainly been much more steady.

R. H. C.

Fort William, August 26th.—There was lodged in the stem of the minimum thermometer 0·7 of evaporated spirit, which was put right by the observer; otherwise the instruments were in good order and well observed.

Fort William, September 23rd–24th.—The clocks of both the barograph and thermograph were taken to pieces and cleaned and new lines attached to the weights and winder. The lenses, condensers, and mirrors received due attention, and the zero dots were changed from the summer to the winter position. In the case of the thermograph traces, it was noticed that the dry and wet dots of light were not exactly one over the other, but these were properly adjusted before re-starting the instrument.

The rain-gauge clock was also taken to pieces and cleaned, and a new line attached to the weight. Rubbings were then taken of the funnels of the self-recording and spare gauges.

The various thermometers were duly compared in water with Kew Standard 720.

T. W. B.

Glasgow, September 20th–22nd.—At this Observatory all the instruments were in good order, excepting that the light shutter of the thermograph failed to cut off the light at times on the wet bulb zero line, but this was put right when cleaning the instrument, and at the same time an attempt was made to improve the definition of the wet bulb trace.

The clocks of both barograph and thermograph were taken to pieces and cleaned, as well as the lenses and other parts of the apparatus.

As regards the anemometer, the external parts were entirely dismounted. The oil in the direction well was found quite satisfactory, but I had it removed and added fresh oil to all the bearings, after which the orientation was examined and found correct.

The clock and recording apparatus were generally cleaned and oiled.

The rain-gauge was also attended to, and rubbings taken of both the self-recording and spare funnels.

The various thermometers were tested in water with Kew Standard No. 720.

T. W. B.

Kew, September 14th.—The various meteorological instruments were performing satisfactorily.

Each instrument was dismounted, cleaned, and lubricated, including clocks.

There is nothing calling for special remark.

The oil for the direction rollers of the Robinson anemograph was very discoloured, but there was not so much sediment as there was last year.

As far as can be judged by comparisons with the Dines and the Lander vanes, which are at about the same height, the Robinson vane gives the proper direction except in winds below, say, 8–10 miles per hour.

E. G. C.

Oxford, September 2nd–3rd.—All the meteorological instruments here were in first-class order; they received the usual examination, cleaning, &c.

The oil in the direction trough of the anemometer was in very good condition, and hardly discoloured at all. Fresh sperm was used. The orientation was satisfactory.

The thermograph screen has been recently repaired and strengthened.

E. G. C.

Stonyhurst, August 11th.—The self-recording meteorological instruments were all in good order, and there was nothing calling for special remark.

Each instrument received the usual cleaning and examination.

The oil for the direction rollers of the anemograph was fluid, but discoloured—fresh sperm was used.

Since my last visit, a new pair of windmill-governors has been fitted to the direction-fan spindle, and is an improvement.

The orientation was satisfactory.

E. G. C.

Valencia, August 25th.—The instruments were in good order, and evidently carefully attended to Each instrument, with its clock, &c., was dismounted, examined and cleaned.

One of the cup arms of the Robinson anemometer has broken: it has been repaired by binding on it a spare arm.

The wooden balustrade on the anemometer tower is perishing, and in time will be dangerous.

It is extremely probable that the velocity records at this station, especially in high and gusty winds, are affected by the low height of the observatory tower, which only just rises above the roof ridges of the house. To give a really good exposure, the tower needs to be raised at least another 15 feet.

I gave Mr. Cullum the necessary instruction in the use of the Fineman nephoscope, but he has no stand at all suitable available at present.

It will probably be necessary to erect a light concrete column. A good site could be found in the present Stevenson screen enclosure, commanding a good range of sky.

E. G. C.

GROUP B.—ADDITIONAL ANEMOGRAPH STATIONS.

Bath, August 6th.—*Pressure Tube Anemometer.*—I saw the recording part of this instrument but was not able to open it to examine the float, &c. The water-level was low, and this I rectified. In addition ametal "tommy," weighing probably an ounce, had been added to the pen, thus increasing the weight of the float and making it very sluggish and incorrect in light to moderate winds. I removed the extra weight, and cleaned as well as I could the pen-rod to reduce the friction caused by its having become rather corroded. I also re-adjusted the pen, and left it working better than I had found it.

Dr. Symons' assistant promised to call attention to the alterations I had made.

Owing to its being Saturday afternoon, and the office being closed, I was unable to do more to the instrument.

R. H. C.

Deerness, September 28th–29th.—At this station the anemograph was found to be in good working order, as usual, well attended to by Mr. Spence.

The external portions of the instrument were thoroughly cleaned and all bearings supplied with fresh oil, as well as the clock and recording apparatus. Afterwards, the orientation was examined and found correct.

The head of the pricker had dropped off on the morning preceding my visit, but this I had re-fixed by soldering before leaving.

T. W. B.

Dublin, Phœnix Park, August 19th–20th.—The anemometer appeared to be working freely. It was dismounted and cleaned.

There was not much oil in the brake-box, and what there was had become dirty. The box was filled with fresh sperm.

The ball-bearings for the direction were sufficiently lubricated, and the ball-race shews but little sign of wear.

The clock was much over-oiled, and I instructed Corporal Rose to oil the pallets only, and at longer intervals.

The question of the time on the curves seems to be due to the mixing up of G.M.T. and I.T.; the sheets are practically always changed at 10 a.m. G.M.T.

Since my visit in 1902, a rather large building has been erected to the N.E. of the anemometer, and nearer to the instrument than any of the older buildings.

A new plantation has also been laid down, fairly close to the staging, and running from S.–N.

E. G. C.

Fleetwood, August 12th–13th.—I found the Robinson anemometer generally in good order. The instrument was dismounted, both exterior and interior portions, and all parts cleaned.

The oil was rather dirty, but still fluid.

Parts of the cup rod and the cups needed painting, and this was done.

I found that the gut on the clock barrel had become worn and untwisted, so I fitted a new line and altered pendulum, as clock was inclined to gain. Orientation satisfactory.

Since my last visit the structure on which the anemometer formerly stood has been removed, and a much larger building erected.

The cups now are approximately 44 feet from the ground, and 108 feet above sea-level, and as the "Mount" is the highest point in Fleetwood and the slopes are gentle, the exposure may be considered a good one.

E. G. C.

Holyhead, August 15th–17th.—*Robinson Anemograph.* The examination and cleaning of this instrument was carried out under difficulties, the weather being stormy.

Generally speaking it was in good order, and the sperm for the direction bearings was in an excellent condition.

All parts were cleaned.

I found there was but little oil in the cell in which the ball bearings for the velocity reducing gear revolve.

The iron platform at base of instrument, carrying the reducing gear, step-bearing, &c., was loose and could be tilted up; it was put right.

The spring fusee clock was cleaned and oiled. In testing the orientation, allowance was made for the error said to exist in the vane. I must confess, however, that I was unable to detect the error, although I fitted up a light and sensitive vane immediately over the other—the wind blowing about 30 miles per hour.

Bridled Anemometer.—The cord carrying the weights of this instrument had broken on the day preceding my visit.

The instrument was dismounted and cleaned, and a new cord fitted. It was in good order and well lubricated.

The driving clock was cleaned.

A further supply of the metallic cord is now required.

Dines Pressure-tube Anemometer.—There is nothing special to remark about this instrument.

The water was clean and there was but a small amount of deposit on the brass collar of the float. This was removed, all parts cleaned, clock oiled, &c.

Before and after dismounting it, I made a series of comparisons with a 10-in. water-gauge, the particulars of which have been forwarded.

The float seems to me to take a rather long time to fall from, say, 10 miles to zero.

Maximum Pressure Plate (Non-oscillating).—Mr. Davis did not appear to be satisfied with the working of this instrument, the values of late appearing to be low.

On examining it, I found that one of the thin brass pieces holding the guide-rollers at back of plate was bent, and the roller jammed against the brass slip, so that the plate moved stiffly. The woodwork to which the brass slips are screwed has opened out a little, and there was about $\frac{1}{20}$ in. difference in width between the centre and the ends of the run.

I reduced this as much as was possible, altered the rollers, and cleaned all parts of the instrument, and it appears now to work more freely.

In accordance with instructions, no change was made in the adjustment of the spring.

E. G. C.

Nottingham, September 15th.—There is a Dines anemometer at this station. It is exposed on the North-eastern gable of the engine-house, with its vane head 46 feet above the ground and 8 feet above the roof.

There is nothing so high in the immediate neighbourhood except the chimney shaft, which is to the south-westward, and so far away as not materially to influence the indications.

The pumping station is in the valley of the Trent, and practically on a level with the river bank.

I looked at the curves and found that the trace was thick and coarse. I therefore advised that a new crow quill pen be fitted.

I advised also that a comparison be made between the forces by Beaufort scale, as estimated by Mr. Ings (the telegraphic observer), and the velocities as shown by the curves, and that in any case of difficulty reference should be made to the Office for advice.

The curves are mounted in guard books at the Guildhall, and Mr. Brown, the City Engineer, will be pleased to allow the Office the use of them if occasion arises. The record exists from January 1st, 1904.

J. A. C.

Plymouth, July 30th.—*Pressure Tube Anemometer.*—At Mr. Prigg's request I examined this instrument and found it in a very unsatisfactory condition. The water-level was low, the water very dirty with a thick red deposit, and the pressure-tube quite sealed by water which had apparently been syphoned into it. The record as I found it was useless, and I could not ascertain for how long a period the instrument had been in the same condition.

The water was changed, the float, &c. cleaned, the necessary adjustments made, and the working of the float tested by gauge. Its working was then satisfactory.

The difficulty here is similar to that found elsewhere—the instrument has to be left in charge of a rather elderly man who has never been accustomed to instruments requiring careful handling, and who fails to realize the importance of small points in connection with them.

R. H. C.

Scilly, July 22nd–26th.—*Pressure Tube.*—This instrument was not in a satisfactory condition. The water-level was low, and the float was much too heavy; on closing the taps it fell with a distinct thud upon the bottom of the tank. On testing it with the gauge I found a movement of the float equal to five miles when it should have been ten, and the record was too low right up the scale.

Upon opening the tank I found the water clear, and fairly free from deposit. The float is slightly dented in places; and from the pen-rod I emptied quite a quantity of water, whilst I should think a dessert spoonful of water had become lodged *upon* the float. The upright pipe over which the float is placed—the pressure tube—was also bent out of the vertical, and had probably caused a little friction when the float rose.

The float was cleaned and fresh water supplied, and an endeavour made to straighten the air tube. When the adjustments had been made a fresh trial with the gauge gave a satisfactory result, and the float was certainly much more lively than before. The vane was removed and cleaned, and the air-holes of the suction part were also cleaned, a ladder being raised against the mast.

It seems certain that the difference observed in the Pendennis and the Scilly records must have been due rather to a defect in the Scilly record than to an excess in that of Pendennis.

Robinson Anemometer.—This instrument was also less satisfactory than it usually has been. There was a lack of oil in some places, and an excess of dirt in others. The entire instrument, including the clock, was taken to pieces and cleaned, and it has since worked satisfactorily. I found less oil than is necessary in the brake-box. The box ought to be filled to the top, and to the omission to do this I attribute the very large oscillations sometimes recorded by this form of vane.

The fence around the pillar on which the anemometer is placed is perfectly decayed; the wood cannot hold a nail, and the entire fence can be moved about in almost any direction. It is useless as a protection to the instrument, and I therefore asked Mr. Hicks to get an estimate for putting up a new one, and to forward it to the Meteorological Office. Unless a proper fence is placed around the instrument it is very liable to be interfered with.

R. H. C.

Shields, North, August 31st–September 1st.—I found this instrument in good order, well oiled, and apparently carefully attended to, but also much in need of the annual over-haul and cleaning. Its position at the bottom of a disused chimney shaft exposes it to much dust.

I dismounted both the external portions of the anemometer and the recording apparatus and thoroughly cleaned all parts, and then, lubricating it with fresh sperm oil, left it in good order.

The orientation sheet, taken after the instrument was re-started, has been forwarded.

The work designed to ensure safety in access to the instrument has now been carried out, as arranged with the Tyne Improvement Commissioners.

It consists of hoops of iron, bolted to the sides of the iron ladders leading to the instrument. These hoops are eight in number. They are made of square iron rod, $\frac{1}{2}$ in. thick, and are connected one with the other with copper wire of about $\frac{1}{10}$ in. gauge.

The hoops vary in size and shape, being larger where the vertical and sloping ladders join, and there is no difficulty in passing up or down. The topmost hoop is within reach of the footshelf in front of the anemometer, but there is still no protection to anyone engaged at the instrument. It is to be regretted the Office did not ask that while the work was in progress a foot-board might be placed on the roof and a railing fixed around it.

However, the present arrangement is a very great improvement on that previously existing, and the approach to the instrument is now practically safe.

The work has been carried out satisfactorily.

J. A. C.

Yarmouth, October 7th–8th.—The anemometer here was found working very well, and is in excellent order, the traces obtained with the new silver helices being very good.

I entirely dismounted the instrument and had all parts cleaned and the bearings lubricated with fresh oil, after which the orientation was examined and found correct. Mr. Watson informed me that he intended to have the anemometer and stand painted before the winter sets in.

T. W. B.

Group C².—Additional Rain-Recorder Stations.

Coventry, September 16th.—There is a Negretti and Zambra self-recording rain-gauge at this station. It is exposed with its rim about 5 feet above the ground, in the same enclosure as the ordinary gauge. The small pipe was choked at the time of my visit, but the obstruction was removed and the instrument left in good order. The curves are filed in Dr. Snell's office.

J. A. C.

Nottingham, September 15th.—There is a Halliwell rain-gauge at this station, placed in the enclosure close to the 8-in. gauge used for the telegraphic observations.

Considerable trouble was experienced with the instrument at first, but the difficulties appear to be overcome, and the machine is now working well.

The records are mounted in guard books at the Guildhall, and Mr. Brown will be pleased to allow the Office to use the information if desired to do so.

Some complaint was made as to the quality of the clock, and if further difficulty is experienced in this direction the present movement will probably be replaced by a better one of English make.

The records are available from the beginning of 1904.

J. A. C.

Group S.—Additional Sunshine Stations.

Guernsey, Villa Carey, July 14th.—The sunshine recorder at the station (a single pattern Jordan) appeared to be in good order and to give satisfactory traces. The exposure is satisfactory.

I explained to Dr. Carey the position which the Council have taken up with regard to photographic sunshine recorders.

R. G. K. L.

Jersey, St. Helier's, July 13th.—See page 75.

Ramsgate, July 21st.—The exposure of the sunshine recorder is satisfactory. The records on the cards were not symmetrical. On examining the instrument I found that the lens was not central in the bowl. I set this and adjusted instrument for time. The adjustment for level appeared correct, but the maker's name plate was attached in such a manner that it was impossible to test this satisfactorily.

R. G. K. L.

Salcombe, August 1st.—The sunshine recorder has an excellent exposure on the top of the hill above the town. The horizon is perfect and the instrument is well attended to. The results it yields will supply a very satisfactory exponent for the sunshine of the district. Dr. Prowse is assisted in the care of the instrument by Mr. Lampard, the Manager of the Wilts and Dorset Bank in the town.

R. H. C.

Scarborough, September 6th.—The sunshine recorder was removed on March 30th, 1904, to a new and better position on the top of the tower at the fire station, the ball being 62 feet above the ground.

Except from NE. to E by S., where the Castle interferes to a slight extent, the exposure is perfect.

The instrument is now in the charge of Mr. Birkbeck, the Engineer, who appears to attend to it very carefully.

Some adjustment was required for latitude. This I made, and then re-cemented the instrument in its place.

The cards supplied for use are too large, and a small strip is cut off both from top and bottom before they are used.

The thermometer screen and rain-gauge at this station have also been moved since last inspection. They now stand in a small lawn overlooking the harbour, and close to the top of the cliff tramway, and about 38 ft. higher than in their old position.

J. A. C.

GROUPS D. AND E.—NORMAL CLIMATOLOGICAL STATIONS* (SECOND ORDER STATIONS of the INTERNATIONAL CLASSIFICATION).

Aspatria, August 5th.—Everything at this station was found to be in excellent order. The instruments are all well exposed, and the observer, Mr. J. Smith Hill, B.Sc., takes much interest in the work. The situation is a very open one.

F. J. B.

Ballinacurra, September 21st.—This station has been established by Mr. H. Bennett in connexion with the Experimental Farm at Ballinacurra, which is under the auspices of the Irish Department of Agriculture. The equipment is first-class, and the exposure of the instruments excellent. The observations are taken by Mr. John Smith, under the direct supervision of Mr. Bennett, and I found him to be an accurate observer. Mr. H. Hunter, barley expert, writes the monthly sheet for this Office, and makes the necessary corrections and reductions. The barometer hangs in the office of the malting house and is well placed, although subject during winter to slight fluctuations in temperature. Thermometer screen, sunshine recorder, and rain-gauge, are suitably situated on a grass terrace adjoining a croquet lawn (on the west side) and a field (on the east).

This promises to be a valuable addition to the climatological stations in Ireland.

C. H.

Bettws-y-coed, August 12th.—This station is a new one, and had not previously been inspected.

The exposure of the instruments is, upon the whole, good, and is as satisfactory as it is possible to expect in a place like Bettws-y-coed, surrounded by high wooded hills.

The instruments were all in an excellent condition, and the observer, Dr. Macdonogh, takes much interest in the work, to the extent of issuing local forecasts, based largely upon those contained in the daily weather report. These, with the current observations, are posted up at the gate leading to the house, and are regularly consulted by many of the residents and visitors.

F. J. B.

Cally, September 2nd.—The instruments were all in very good order. The observer takes a good deal of interest in the observations, which he makes carefully and correctly. The amount of cloud will, in future, form part of the observations.

A. B.

Cargen, September 5th.—The instruments were in very good order, and the observations are carefully and correctly made. Mr. Peacock has been upwards of 40 years observer at Cargen, and his monthly schedule, for fulness and penmanship, is excelled by few.

A. B.

Carlisle, August 5th.—The instruments were in good order, but a change was suggested in the position of the Fortin barometer. It is at present in a very bad light, and is placed so high that it is impossible to read it without standing upon a step.

The thermometer screen is an open one of the Glaisher pattern; the observer assured me that the sun never reached the instruments.

The station is upon the whole a good one, and the acting observer, Mr. J. Veitch, appears careful and intelligent.

F. J. B.

* A Normal Climatological Station is one at which readings are taken each day at 9 a.m. and at 9 p.m., local time, and which is provided with the following instruments properly verified and exposed:—Barometer, dry-bulb, wet-bulb, maximum and minimum thermometers, and rain gauge.

Castletown, Isle of Man (*King William's College*), August 8th.—This is a new station, and had not hitherto been inspected. The instruments are all well exposed, and the observations are made by one of the senior pupils.

At the time of my visit the summer vacation had commenced, and I found that during this time no arrangements had been made for carrying on the work.

Mr. W. S. Christopher, the secretary of the school, met me and afforded every assistance in the process of testing the various instruments. He believed that the failure to provide a substitute in vacation time was due to an oversight on the part of Mr. Kempson, the head master, and that such a difficulty was not likely to recur. He could suggest no one as being capable of taking up the work for the present, so that until the school meets again on September 10th, or thereabouts, no observations can be taken.

F. J. B.

Cheltenham, September 5th.—There was a little spirit at the top of the tube of the grass minimum. I recommended that the grass mimimum be more exposed. The Jordan sunshine recorder was in good adjustment. The Robinson anemometer was not working very satisfactorily. The observer, some time ago, in cleaning the mercury in the cistern of the Fortin barometer let some air get into the tube. When I called his attention to the fact that the barometer was reading too low, he sent the instrument to the maker for rectification. In transit, however, the tube was broken; consequently a new tube had to be put into the barometer. The instrument is now satisfactory.

W. M.

Clacton-on-Sea.—See p. 75.

Cockle Park, September 2nd.—I found everything in very good order at this station, and Mr. Birt, the new observer, is intelligent and, I think, careful. I believe that with a little more experience he will prove to be an excellent observer.

I asked that the thermometers might be read to tenths of degrees in future, and this it was promised should be done.

J. A. C.

Crathes, August 5th.—The instruments are remarkably good, and placed well, and the observations are specially well observed by Mr. Smith and family.

A. B.

Cronkbourne, Douglas, Isle of Man, August 8th.—This station is in all respects a most efficient one. All the instruments are in excellent order, and the observations are evidently made with the greatest care and regularity.

F. J. B.

Deerness, August 12th.—The instruments are all in excellent order, and the observer is painstaking and accurate, and sends in a schedule remarkable for the fulness of information it contains.

A. B.

Dublin, Phœnix Park.—See p. 55.

Dublin, Trinity College, September 17th.—This new station, which is in charge of Prof. Thrift, F.T C.D., promises to be a very valuable one, and is peculiarly well situated in the Fellows' Garden of the College. The barometer is kept in a large room in the old magnetic observatory in this garden, and the sunshine recorder is placed on the roof of the building. Thermometer screen, solar radiation thermometer, grass minimum thermometer, earth thermometers, and rain-gauge are well situated at some distance to the north of the building on the lawn, this site having been selected by Sir John Moore. Mr. A. R. Moore, his son, is the observer, and is versed in the work and much interested in it. Prof. Thrift's general supervision is another item ensuring efficiency.

C. H.

Dundee, August 2nd.—The instruments all continue to be well kept, and the observations are made with very considerable intelligence and fidelity.

A. B.

Dunmow, Bigods Hall, July 21st.—This is an excellently planned station, being in the midst of the experimental plots of ground in the Countess of Warwick's Agricultural School, the instruments being thoroughly well exposed. The barometer is suspended in a little wooden hut within the meteorological enclosure, but as the interior of the hut becomes very hot on sunny days, I recommended the removal of the instrument to the spacious entrance hall of the house, where it would be subject to comparatively slight changes of temperature, and at the same time be more easily accessible to read at any time. (In its present position, out in the field, it involves a walk of at least 200 yards each way to ascertain what it is doing.) With the exception of a defective grass minimum the instruments are in very good order. It seems probable that the intense drought has been the cause of the sunshine recorder brick pillar sinking slightly (about $\frac{1}{8}$ in.) to the westward. Mr. Hacking, formerly at Cockle Park, takes great interest in meteorology, and he is ably seconded by Mr. Holloway, who undertakes the work of observation and reduction.

In the training of the pupils, one of the features of the school is the inculcation of the habit of observing natural phenomena. The boys, therefore, are taught to be systematic in recording the various meteorological instruments, noting the wind direction and its force, the forms and movements of clouds, &c., as do the boys on the training ships "Worcester" and "Conway," but they are encouraged to go a step further;—after taking observations, they make a forecast (in writing) of what the present changes will probably lead to in the course of the day.

As it is intended that the boys shall eventually become responsible agriculturists, it is obvious that this training of the habit of close observation in early life cannot fail to be of the greatest value in after years.

H. H.

Dunrobin, August 16th.—The minimum thermometer was found out of order, being 1°·4 too low, with evaporated spirit at the top or in the tube. The instrument has been either inadvertently changed or damaged since last inspected.

The other instruments were in very good order, and the observations continue to be carefully made.

A. B.

Fort Augustus, August 24th.—Much enthusiasm is manifested by the observer, the Rev. Cyril von Dieckhoff, in the work of this station, where everything is in good order and the work of observing is carried on with the greatest care.

A. B.

Fulbeck, September 12th.—I found everything in good order except that the legs supporting the thermometer screen have become decayed close to the ground, and, in consequence, the screen is easily shaken. Mr. Willson promised to have this defect rectified at once.

Both Mr. Willson and Mrs. Willson set and read the barometer correctly.

J. A. C.

Garforth, September 9th.—This station is at the Experimental Farm in connexion with the Yorkshire College, Leeds, and is under the superintendence of Prof. Seton, M.A., the head of the Agricultural Department.

The instruments are admirably exposed, and the observations well represent the climate of this part of Yorkshire.

I called attention to certain abnormal readings which had been reported. Some of these may be attributed to the positions of the maximum and minimum thermometers in the screen, and I altered the adjustment of these instruments accordingly.

The earth temperatures are not at present observed. I spoke of their importance; and I recommend that Prof. Seton be asked to obtain the requisite instruments for 1 ft. and 4 ft. and to start the observations.

The observations are taken by Mr. Edwards, the Farm Manager, and Mr. Smith, the Engineer. Both are competent observers.

J. A. C.

Geldeston, July 14th.—Mr. Dowson is an enthusiastic meteorologist, and is recognised as an authority on the equipment of a station and the exposure of instruments, so that Geldeston may be regarded as a type of what a well-found station should be, everything being in good order and properly attended to.

H. H.

Glasnevin, September 16th.—The thermometer screen, solar radiation thermometer, grass minimum thermometer and rain gauge, formerly in somewhat too close proximity to trees and shrubs, and liable to interference by visitors, are now situated outside the Botanic Gardens proper on new grounds adjoining the Gardens, and immediately to the south of them. A large triangular area, far removed from buildings, trees and shrubs, is fenced in with barbed wire. The arrangement is admirable, and the site excellent. The screen is in good repair, but needs at least two coats of white paint. All the instruments are in good order except the barometer, the vernier of which fails to retain its position when set. Both the observer and his assistant are experienced in the work, and are thoroughly efficient.

C. H.

Guernsey, Fort Road, July 14th.—Exposure.—Excellent.

Instruments.—Satisfactory, but barometer has not been to Kew since last sent to makers for repairs.

Observations.—Excellent.

The station is situated on plateau in centre of island, near its highest point; there are no tall trees near, and the house is distant from the instruments considerably more than twice its height. An almost uninterrupted view of horizon is obtained from anemometer tower; the nearest shrub is about 6 ft. below level of cups.

The instruments are all in excellent order, and spare thermometers are available in case of accidents. (*See* note on barometer above.)

Observations of a very full and detailed kind are taken. In addition to the ordinary observations of a second order station, readings of earth thermometers at 6 in., 1, 2, 3, and 4 ft. are taken. Clouds are distinguished into "upper" and "lower," and their directions of motion are determined by steadying the head against a post and sighting the cloud against the top of the wind vane.

R. G. K. L.

Hull, September 9th.—Everything was in good order at this station. The thermometer screen and rain gauge have been moved since last inspection to another site then selected. The removal has resulted in improvement. The new grass minimum read 1°0 lower than my standard, although I could detect no separated spirit.

Earth thermometers at 1 ft. and 4 ft. are now in use.

The observations are conducted by Mr. Witty, the Parks Superintendent, who takes much interest in the work and does it very carefully.

J. A. C.

Lairg, August 17th.—The station has been greatly improved by the cutting down of trees, and others will be cut down shortly. The observer takes a good deal of interest in the observations, and is a careful observer.

A. B.

Laudale, August 27th.—Since the death of Mr. Fletcher in July, his son, who succeeded him in the management of Laudale, has been in charge of the station, assisted by his sister, Miss D. B. Fletcher.

Unfortunately, Mr. Fletcher was unavoidably from home on business, but his brother, Alexander Fletcher, an Edinburgh student of arts, was at home for some months. He has been an occasional observer for some years and is quite familiar with all the details of observing. We went fully into the work, and he has undertaken to see that his brother and sister fully understand before he leaves for Edinburgh.

The instruments were all in excellent order.

A. B.

Lincoln, September 12th.—The instrumental part of the work at this station is very carefully attended to by the observer, Mr. W. H. Curtin, F.R. Met. Soc., and his assistant, and the returns are full and complete. With regard to the non-instrumental observations, some instruction was needed, which I gave as far as possible. The exposure of the instruments is good, and the records satisfactorily represent the climate of Lincoln.

There is no suitable exposure for a sunshine recorder at the present station, but it is possible one may be set up at a hospital which is being built on the outskirts of the city.

A note of the daily observations is regularly exhibited outside the municipal offices.

J. A. C.

Llandudno, July 8th.—This station was in good order. On comparing the thermometers it was found that the dry and wet bulbs had both gone up 0°·2. The sunshine recorder is mounted on an iron column. The spot of light was on the noon line of the card at 12.0 local time. The barometer is mounted in the Sanitary Inspector's office at the Town Hall, but it is reading ·047in. too low.

W. M.

Manchester (*Whitworth Park*), August 9th.—In addition to the ordinary "climatological station" outfit, this station is furnished with the following instruments:—

(A.) A Robinson anemograph, Kew pattern, complete.

(B.) A Grand Modèle Richard barograph, ranging from 27in.–31 in.—Weekly charts.

(C.) Do. do. thermograph, do.

(D.) Solar maximum, black-bulb.

Do. do. (*in vacuo*).

(E.) A duplicate set of the above. Two solars.

(F.) A grass minimum—link bulb.

(G.) A Campbell-Stokes sunshine recorder.

(A.) I received no authority or instructions as to dismounting and examining any recording instruments, but as I understood from the observer that he forwarded to the Meteorological Office the average velocity and the total daily run in miles from the Robinson, I thought it advisable to examine the instrument.

I should hardly think that it has been dismounted since its erection. The bearings throughout were innocent of oil, and the rollers for the direction plate were dry and rusty. Time did not permit me to dismount it entirely, but I freely lubricated it, and gave a supply of sperm oil for the roller bearings, cleaned and lubricated the reducing gearing, &c.

The recording apparatus, clock, &c., were in a dirty state. I did what I could to improve these, and tested orientation from bearings furnished me by Mr. Chowdery. Its performance is now much better and the traces distinct, but I am afraid that its value as an anemometer is but small, as the Whitworth Park is surrounded by houses, most of which are higher than the anemograph, which is supported by a square column (of iron plates), about 14 ft. above the pavilion.

(B.) The Richard barograph appears to be in good working order, but there are no blank charts available at present.

(C.) The thermograph is at present under repair.

(D.) and (E.) The solar maximum thermometers are fixed on the top of the pavilion, but the duplicate set are not exposed.

(F.) The exposure of the grass minimum is not open enough, and the metallic shield is unusually large and solid.

(G.) The sunshine recorder is kept on the pavilion roof, but was not fixed or clamped in any way, and had not been properly levelled. I explained to the observer what was required, and he arranged to adjust and fix it.

The rain gauge is in a bad position, being close to a hedge and only about 12 ft. from a greenhouse, whose ridge is 10–12 ft. high. It is altogether too much shut in.

E. G. C.

Manchester (Oldham Road), August 3rd.—The instruments here were in good condition, but it is difficult to keep them clean in such a smoky neighbourhood. The cloud and weather observations were not accurately reported, but directions were given which should lead to an improvement.

The sunshine recorder was at one time out of adjustment, but this has recently been rectified. Observer was instructed to have the recorder firmly fixed in its present position by means of metal clamps.

F. J. B.

Ochtertyre, September 9th.—All the instruments continue to be well attended to, and the observations are made with no small care, correctness, and enthusiasm.

A. B.

Oundle School, July 16th.—The station is admirably placed, nearly in the centre of the extensive school-field, some little distance outside the village, the instruments being arranged, as shown on the rough plan, in a railed-off space of about 9 yds. by 6 yds. Distant trees interfere somewhat with the early and late sunshine, but this defect will be remedied when the new observatory tower is built, Mr. Sanderson, the Head Master, promising to have a suitable position arranged for the recorder on the south front of the dome. The barometer is hung in the school laboratory in the village. All the instruments are in excellent order, and Mr. Morris, the school meteorologist, takes great interest in the work of observing, which has to be done out of school hours. He is a careful and reliable observer, and for the Science Society of the school he prepares a daily report, which is posted on the outside of the school wall for the information of the scholars. Here also are exhibited aneroidograms for successive weeks, and photographs of lightning flashes recently taken by Mr. King, one of the masters.

H. H.

Plymouth, July 30th.—The instruments here were in excellent order, and they are carefully read by Mr. Prigg's assistant, who has now had some years' experience of the work. Attention was called to one or two matters of "method" as desired, and these will be attended to in future.

R. H. C.

Poltalloch, August 30th.—Except the minimum thermometer, which was much out of order, the instruments were well attended to, and carefully and correctly observed.

A. B.

Prestwich, August 3rd.—There is nothing special to note with regard to this station.

The instruments are all excellently exposed, and are in good order.

Dr. Clunn and his assistants are careful and accurate observers, and appear to take much interest in the work.

F. J. B.

Rothesay, August 31st.—In Mr. Kay's hands, everything as concerns the instruments and observations calls for a like favourable report as heretofore.

A. B.

Rousdon, August 16th.—On comparing the thermometers it was found that the wet bulb had gone up 0°·1. The minimum had 0°·4 of spirit up the tube. The sunshine trace was not running parallel with the card, as the ball was too high in the frame. The instrument was subsequently readjusted.

W. M.

Salisbury, Wilton House, July 12th.—Exposure: good. Some small fruit trees on N.E. are rather nearer than twice their height. I moved solar maximum into position in which it would not be in shade at 10 a.m.:

Instruments.—Satisfactory. Screen needs coat of paint.

Minimum thermometer needs correction of + 2°·0.

Earth thermometer at 1 ft. needs correction of − 3°·3.

Mounting of wet bulbs should be changed oftener.

Observations.—Temperature excellent.

Barometer.—Arrangements for taking observations in observer's absence at present not satisfactory.

Wind.—Direction seems good; force, rather unsatisfactory.

Rainfall.—Quite satisfactory.

Weather.—Beaufort notation should be introduced. I greatly regret that Mr. Challis was away, and that I had no opportunity of discussing this question with him.

I gathered the impression that observations are taken with great care. Temperature and rainfall observations are especially good. Conformity to Beaufort scale would increase value of weather observations.

R. G. K. L.

Shrewsbury, August 2nd.—Captain Sladen, R.E., who was hitherto responsible for these observations, has been transferred to the Ordnance Survey Office at Southampton, and has been succeeded by Captain W. E. Manser, R.E.

The thermometer screen was improperly mounted on a wooden table. Directions were given that it should either be fixed, in the orthodox way, on four legs, or that a space should be cut out of the table, so as to leave the base of the screen fully open to the ground.

The sunshine recorder was at one time fixed on the top of the thermometer screen, but it was found that in this position it did not receive the full amount of sunshine. There appears to be no other position available at the Ordnance Survey Office (it is impossible to get on the roof), but Capt. Manser promised that he would consult the local authorities with a view to obtaining a satisfactory site elsewhere in the town.

I learnt, with regret, that it was found quite impossible to continue the 9 p.m. observations. The monthly return will contain in future 9 a.m. observations only. The weekly return will be furnished as before.

F. J. B.

Southampton, July 12th.—Exposure.—Very good. Solar maximum at present gets shaded in late noon, as shrubs on west side have grown considerably; these are to be reduced in size.

Instruments.—All quite satisfactory. Sphere of sunshine recorder very yellow in colour: I have some doubt as to its sensitiveness. The instrument needed adjustment for level.

Observations.—Most carefully taken.

R. G. K. L.

Stokesay, August 1st.—The condition of the instruments was generally very satisfactory, but the rain gauge was not firmly fixed, and the measuring glass was not graduated quite accurately throughout the scale. I suggested that a new glass should be procured.

The position of the station, sheltered as it is by hills, both to the eastward and south-westward is not favourable for securing very reliable wind observations. With light winds, the direction given in the return is probably of a purely local character.

The correction for index error, at present applied to readings of the barometer, appears much too large.

F. J. B.

Whitby, September 5th.—This is a long-established station that has, however, but recently come into connexion with the Office.

The outfit of instruments is very good, including a Campbell-Stokes sunshine recorder. The ground on which the outdoor instruments stand, is, however, not protected in any way but is quite open to visitors. I recommend that the authorities be urged to have the space properly enclosed at once, so as to prevent possible tampering with the instruments.

The rain gauge was too near the edge of the cliff. I selected a better site a few yards distant, and the observer promised to move the instrument at once.

The thermometer screen was too high, and was not firmly fixed. I asked that this might be corrected.

Mr. Newbitt is an experienced and careful observer, and I think the station is a valuable one.

J. A. C.

Whitchurch, Tavistock, August 22nd.—This station was in good order. On comparing the thermometers it was found that the maximum had gone up 0°·3. Mr. Glyde is very keen on all meteorological matters.

W. M.

Wolfelee, September 6th.—The thermometer screen was ordered to be repaired and repainted; otherwise the instruments were in good order. The observer was recently appointed, and instructions were given generally regarding the reading of the various instruments. He promises to be a careful observer.

A. B.

Woolacombe, August 29th.—This station was in good order. The barometer was not hanging quite perpendicularly; the board needed wedging out at the top from the wall. The sunshine recorder was in good adjustment. The hills on the east-north-east and on the east-south-east to south-east make an angle of 7°, and so may intercept a little of the very early sunshine. I urged the desirability of there being a trained deputy observer.

W. M.

Group R.—Rainfall Stations.

Caistor, September 13th.—This is a rainfall station where the observer has recently changed his residence.

The rain gauge is now exposed in a garden on sloping ground, at about 90 ft. greater elevation than in its former position.

There are a good many trees around which shelter the instrument to some extent; and to gain a better exposure I placed the gauge with its rim 3 ft. 6 in. above the ground. There is still some protection from surrounding objects, but in spite of this in its present position the records will satisfactorily represent the rainfall at Caistor.

Mr. Ford takes the observations personally and manifests considerable interest in the work.

J. A. C.

Oundle, July 16th.—The gauge is a very small one, 4·7 in. diameter. It is neither fixed nor level, and its position is unsatisfactory, being in a fruit and vegetable garden, with trees of varying heights—10 to 40 ft. high—within from 6 to 10 yds. of it, only the north-west quarter being open. The observer expressed his willingness to obtain a proper gauge, and also other meteorological instruments if thought desirable, but as the Oundle School station is close by—perhaps less than a quarter of a mile distant across the fields—there would be no advantage in duplicating the records. In its present position Mr. Dixon's gauge should yield results not differing materially from those in the school field. If, however, he could secure rain records in the river valley below, from a suitable gauge, no doubt interesting differences would be disclosed, as Mr. King, one of the masters at the school, explained to me that there are very marked contrasts in the meteorological conditions on the high and on the low ground, especially in the matter of rain and thunderstorms.

H. H.

Group G.—Auxiliary Climatological Stations.

Aberystwyth, August 15th.—This station is in connection with the Royal Meteorological Society, but also reports daily to the Office, by post card, the observations of temperature, weather, rainfall, and bright sunshine. The station was visited in order to arrange, if possible, for a more satisfactory exposure of the instruments, and especially the rain-gauge, which is at present placed near the edge of the castle hill, and therefore fails to record much of the rain which falls in the town itself. I found that Mr. Marriott had inspected the station only a few days prior to my visit, and that he had suggested a new site for the instruments. I concurred in his opinion as to the suggested improvement, but was assured by Dr. Thomas, the Medical Officer of Health, that no definite steps could be taken in the matter until the reassembling of the Town Council in October. Dr. Thomas promised that the matter should then be brought up for consideration.

F. J. B.

Arlington Court, August 2nd.—The present observer has only been in charge since January, but before coming to Arlington he had had experience in taking rainfall observations elsewhere. The instruments were in good order and are apparently carefully read. There are two rain gauges in use, and one gives almost always a higher record than the other, although the same glass is used for the two measurements. The gauges are not far from each other, but the check gauge has, in my opinion, the better exposure, some large trees intervening between the two. I consider the present check gauge amount the more correct, and strongly recommend its acceptance for the future.

R. H. C.

Balruddery, September 8th.—The instruments were in good order, but are now removed to a more open situation near the centre of the large kitchen garden, in a plot of grass, where the exposure of the thermometers and rain gauge is good. The observations are made with care and intelligence.

A. B.

Barnet, July 20th.—The barometer is in the Gas Company's office at the entrance gate; the other instruments are in a railed-in enclosure close by, having a few dwarf trees to the eastward, and the gas-holder a little distance to northward. When first set up by the late Mr. Glaisher the equipment was very good, but the various instruments have deteriorated with age. The thermometers have large errors; the maximum, solar radiation, and grass minimum thermometers should be replaced, and a Stevenson's screen substituted for the Glaisher revolving stand, so as to bring the station into line with others throughout the country. A post, 4 ft. high out of the ground, should be fixed, to take the solar

radiation thermometer, which until now has been placed on grass alongside the grass minimum, its indications being quite unreliable for this reason and the fact that there are portions of the mercury detached in the upper part of the tube. A new rain-gauge is also necessary. Mr. Martin asks for suggestions as to modernising and improving the station, so as to render it equal to any with a similar equipment, and he will do his best to see what can be done in the matter. The official circular relating to the supply of instruments by purchasing through the Meteorological Office was left with Mr. Martin. His assistant, Mr. T. Woods, is painstaking and interests himself in the work of observation, which he has done since the station was first instituted.

H. H.

Barnstaple, August 2nd.—Owing to the collapse and rebuilding of a wall the thermometer screen and rain gauge had been temporarily moved a few yards from their normal position. There was rather too much water on the wet bulb, and the tube of the maximum was loose on the frame and required to be wedged in its place, which was done ; in other respects the outdoor instruments were in good order. The Fortin barometer is not, however, all that could be desired—the mercury and the zero point are dirty, and the instrument is hung in a bad light. A match has always to be used to set the instrument, and even so an accurate setting is a very difficult thing to obtain.

R. H. C.

Bawtry, Hesley Hall, September 10th.—The minimum thermometer had about one degree of separated spirit, which I re-united. I also slightly altered the position of this instrument in the screen, for I found it was not hanging quite horizontally.

The rain gauge, owing to the growth of trees and shrubs, is now somewhat sheltered. I asked Mr. Whitaker to move it to another site, which I selected, not far away, but much more open. This he promised to do at once.

J. A. C.

Bristol, Overcourt Park, August 6th.—The instruments at this station and their exposure are excellent, and the observations appear to be very carefully made by Mr. Dellridge, Mr. Lippincott's head gardener. I heard that another rain gauge is kept at a station about a mile distant, and at an elevation of 100 ft. above the one at the Park, and Mr. Lippincott very kindly promised to send its record each month to the Office.

R. H. C.

Buntingford, July 22nd.—Being in the centre of an extensive field, away from trees and buildings, the site selected for this station is an excellent one, but the enclosure, 6 yds. by 3 yds., is rather small, the wire network being 6 ft. high, with an iron rail running round at about 7 ft. It is just possible that the solar radiation and the grass minimum might be affected. As it is in contemplation to shift the enclosure to another part of the field, perhaps a larger space and a lower fence can be arranged. Except for the antiquated barometer the instrumental equipment is good, and as the wet bulb muslin and wick will now be regularly changed, and the grass within the enclosure, under the screen and the grass minimum, kept short, the records in future are likely to be greatly improved. Dr. Melville Smith takes much personal interest in the subject of meteorological observations, and he proposes to add to his equipment an officially approved barometer, a sunshine recorder, and an anemometer.

H. H.

Cardiff, August 4th.—This is a new station under the control of Dr. Walford, the Medical Officer of Health, and the instruments are excellently exposed in the Roath Park about two miles to the north-east of the centre of Cardiff. The instruments are good and it is intended to add a grass minimum thermometer and a wind vane to the outfit. The mounting of the wet bulb was not satisfactory, but in other respects the station was in excellent order and the observer appeared to be very keen about his work. Other temperature and rainfall observations are at present being taken by Mr. Pettigrew, the Superintendent of the Parks, at a station about 150 yards distant, and these are used as checks upon the others.

R. H. C.

Chester (*Hawarden Bridge*), August 11th.—This station supplies only maximum and minimum temperatures and rainfall observations for publication in the weekly weather report.

The thermometer screen, which was at one time insecurely fixed, has recently been strengthened, but I advised that further support is necessary, as the station is very much exposed to high winds. Many of the abnormal temperatures hitherto reported were due to the fact that the thermometers were shaken.

F. J. B.

Cody Weston, August 3rd.—I found this station in a satisfactory condition. The thermometer screen is now more firmly fixed, as requested on the last inspection, and turf has been laid down around the rain gauge.

The rain gauge is still somewhat sheltered by growing plants, but only temporarily. It is impossible to find a site in the garden that would be free from objection all the year round.

Miss A. Tasker is a careful and competent observer who takes much interest in the work.

J. A. C.

Coventry, September 16th.—The mercury in the cistern of the Fortin barometer was corroded, making it difficult to set the zero point accurately. There was 9° of separated spirit in the grass minimum, which I corrected. With these exceptions everything was in good order.

The observations are conducted under the superintendence of Dr. E. Hugh Snell, the Medical Officer of Health, and they are taken by Mr. Gamble, one of his assistants. Mr. Gamble reads correctly and will, I believe, prove a very careful observer. The outfit of instruments includes earth thermometers at 1 ft. and 4 ft., and a Negretti and Zambra self-recording rain gauge.

I asked that the temperatures might be taken to tenths of degrees in future, and Dr. Snell readily promised this should be done. He also promised to have a small tree cut back which now shelters the rain gauge to some extent.

The sun recorder is a Jordan. I told Dr. Snell that the Council had decided not to publish results from these instruments after 1904. I recommend that the local authority be also informed of this decision and of the reasons which led up to it, and that they be asked to obtain a Campbell-Stokes recorder.

J. A. C.

Cullompton, August 18th.—On comparing the thermometers it was found that the dry bulb had gone up 0°·2. The grass minimum had some spirit up the tube. Mr. Turner has a glass shade over the sunshine recorder. Air is permitted to get inside the shade, so there is no steaming on the glass. There is a possibility of a tree in a neighbouring garden to the east-south-east soon intercepting the morning sunshine.

W. M.

Felixstowe.—July 13th.—The station occupies a good position near the sea shore on the low ground between Felixstowe and Harwich, and the exposure of the screen and sunshine recorder is very good, but the soil is a loose sand, and the wind drifts the sand about in such quantities that the wet bulb thermometer must frequently be rendered useless. On the occasion of the inspection the muslin (much too long) above the bulb was stiff with sand and salt, and although the wick was thoroughly saturated up the loose portion from the water, it was perfectly dry round the neck of the bulb, and the muslin round the bulb was also quite dry. Consequently the dry and wet bulbs read alike. Dry 73·3, wet 73·1+0°·2 correction. On refitting new muslin and wick there was a fall of several degrees in a few minutes. Mr. Mills will in future change the muslin and wick frequently—probably this should be done weekly. All the instruments in use are excellent and the observer is fully qualified to be in charge of them.

H. H.

Hereford, Belmont, September 2nd.—On comparing the thermometers it was found that the dry and wet bulbs had both gone up 0°·2. I recommended a rearrangement of the thermometers in the screen. A new maximum thermometer had been obtained some time ago. As this requires a great deal of shaking to set it I urged the observer always to see that it practically agreed with the dry bulb and minimum when set. The grass minimum had a little spirit up the tube.

W. M.

Leeds, August 2nd.—Mr. Crowther was unfortunately absent at the time of my visit, but I saw the youth who takes the readings, and who is an intelligent boy of about 15 years of age.

The out door instruments are placed on the roof of the museum, which is in the centre of the city. The roof, though large, is not flat, but is broken up with small roofs, skylights, &c., and there are, moreover, higher buildings in the immediate vicinity, so that the circulation of air must be interfered with to some extent.

The screen is not of the standard pattern, nor is it painted white. The lowest thermometers are only 2 ft. 9 ins. above the roof, which is of lead. The bottom of the screen is, however, boarded over, though not closely. The top of the screen is covered with thick felt.

The thermometers are satisfactory instruments, and they agreed closely with my standard.

The rain gauge is also exposed on the roof of the museum, but at a higher level than the thermometers. It is made of zinc, square in section, with 10 in. sides. The sides are, however, not true, and the diameters vary from 9·8 ins. to 10·3 ins. The rain received is led through a pipe, and is drawn off and measured in the entry at the head of the stairs leading to the roof. I was unable to properly test the measuring glass, but it appears to be correct.

There is a Fortin barometer, the readings of which are, however, not sent to us. It is very dirty and difficult to read. The vernier is not used in taking the reading.

There is also a large size Richard Barograph in use, the papers from which are filed in the museum.

As at present established the station cannot be regarded as satisfactory, and it is greatly to be regretted that so important a city as Leeds should not have its official meteorological outfit exposed under standard conditions, so that the results of the observations might be directly comparable with those at other places.

J. A. C.

Llangammarch Wells, August 3rd.—Since the last inspection this station has been entirely remodelled, and it is now quite satisfactory as regards equipment and exposure of instruments, and observer. Dr. W. Black Jones is very anxious that the station should be as complete as possible, and he will welcome any suggestions either as to outfit or method which the Office may desire to make. The observer—who is the gardener—was absent on the day of my visit, but Dr. Jones is satisfied the observations are now carefully made. There is at present no grass minimum thermometer, but one will be obtained if the Office will recommend it. The locality is not a very good one for a sunshine recorder, owing to the horizon being limited by the surrounding high hills, but insolation is a subject to which Dr. Black has given a good deal of attention.

R. H. C.

Maidenhead, July 22nd.—Mr. Palmer was unfortunately away on the day of my visit.

Exposure.—Poor. The park is surrounded by tall trees so that the wind is much interfered with. The thermometer screen is placed in the kitchen garden, over bare ground. It is at a distance of about 7 yards from a high red brick wall which faces south; radiation from this must influence the readings considerably. The rain gauge is placed between the strawberry and potato beds, near a path. There appears to me to be some danger of water being splashed into the gauge accidentally when watering operations are being carried out. I doubt whether a site could be found within the grounds in which the distance of the instruments from the nearest object would be not less than twice the height of that object, but the present arrangements could be improved upon. The grass beyond the path on the south side of the croquet lawn, or a railed-in portion of the field beyond it, struck me as a suitable exposure.

Instruments.—The thermometer screen is one with large single louvres; its dimensions are 1 ft. 11 in. by 1 ft. 3 in. by 10 in., and the thermometers are attached to a board within it. The mounting of the wet bulb was rather dirty; this instrument appears to read 0°·7 too high. The funnel of the rain gauge was placed in an empty champagne bottle; it was level and firmly fixed, and fitted well. The barometer is in good condition.

Observations.—The observer (the head gardener) has had previous experience of meteorological observations. It has been the practice to read to whole degrees, and Beaufort notation is not used in entering the weather, though observer is familiar with it. I found 0·3 in. water in the rain gauge, though there had been no rain since the preceding hour of observation.

R. G. K. L.

Monmouth Grammar School, August 5th.—Unfortunately, both the Headmaster, Mr. Culley, and the observer, Mr. Coates, were absent at the time of my visit, the school vacation having begun. The instruments are very good, as is also their exposure. The observations were in charge of the gardener, who unfortunately was also away on a day's holiday, but from the evidence I saw I think the readings are carefully made. Mr. Coates will be glad of any suggestions the Office might like to make for bringing his methods, &c., into line with theirs. I think the station promises to become a very good and useful one.

R. H. C.

Newport, Mon., August 5th.—This is a rainfall station, but maximum and minimum thermometers are fairly well exposed in the large yard, which is the depôt of the Corporation Waterworks, and, although the exposure is not ideal, they should give reliable data respecting the air temperature of the town. The observations, both of temperature and rainfall, are carefully and intelligently made.

R. H. C.

Newquay, July 28th.—Dr. Vigurs desires to send observations of temperature and of rainfall to the Office direct, for publication with his returns of sunshine. The instruments are good, as is also their exposure; but building operations are encroaching upon the site, and in the near future another will, no doubt, have to be chosen. The observations are made by Dr. Vigurs, who is an experienced and very careful observer.

R. H. C.

Nottingham Castle, September 15th.—Everything was in good order at this station, where there is a complete outfit of instruments, and where the observations are very carefully conducted by Mr. Johnson, one of the city Engineer's assistants.

Daily observations are taken with instruments exposed on the castle roof, but these are not supplied to the Office, nor published in any way.

Some ivy to the eastward of the rain gauge had grown so much as to shelter the gauge from that quarter. It was promised this should be reduced, or removed at once.

J. A. C.

Portsmouth, July 19th.—Instruments.—Satisfactory; but sunshine recorder is a single-pattern Jordan.

Exposure.—Very good town exposure; sunshine recorder somewhat sheltered on north of east and west line.

Observations.—Carefully taken.

I was able to take the 9 a.m. observations with the observer: they appear to be carefully taken. The instrumentarium of the station has recently been greatly improved by the addition of a Stevenson screen. The sunshine recorder was badly out of adjustment; this I set at noon.

R. G. K. L.

Preston, August 4th.—The instruments here were, upon the whole, in a good condition, but the dry and wet bulb thermometers showed a rather large error, being respectively 0°·8 and 0°·9 too high.

The exposure of the instruments, in a confined back yard, is extremely unsatisfactory. Enquiries were made as to whether a better site in the town was not available. Dr. Pilkington, the medical officer of health, stated that, even if such a change were possible, there would be great difficulty in finding anyone to take the observations. At present they are under his personal control, one of the clerks in the sanitary offices being the actual observer.

F. J. B.

Reading, July 22nd.—Exposure.—Good. The screen is quite freely exposed, the standard condition being satisfied. The rain gauge is rather too near the edge of a ditch; I suggested moving it a few feet further south so as to avoid eddies. Tall trees on the outer margin of the ground afford some shelter against wind.

Instruments.—Satisfactory. Rim of rain gauge slightly dented.

Observations.—Some of the older boys act as observers; changes are therefore frequent, but Mr. Little, who is in charge of the station, instructs all new hands carefully. It had been the practice to enter the morning and evening observations in different note books. I pointed out that under these circumstances it is impossible for the observer to be sure that the readings of the maximum and minimum thermometers should be the absolute highest and lowest respectively of the previous 24 hours. In future only one book will be used. During the holidays the Headmaster, and in his absence the gardener, takes the observations.

R. G. K. L.

Rugby, September 17th.—The arrangements at this station were changed at the beginning of August, Mr. Kirk, the gardener, who had had to do with the observations for many years, ceased observing then, and I found Mr. Fox, assistant in the Physical Laboratory, in charge. Mr. Fox is a competent observer, though new to meteorological work.

The instruments in use are very good. The barometer has been moved to a new and better position, at the same level, where it is free from direct solar influence. The thermometer screen is however very much sheltered by trees, it was painted stone-colour instead of white, and was not fixed in the ground. The rain-gauge is also much sheltered by trees.

In the absence of Mr. Samson, the master superintending the work, I was unable to take any steps towards securing better positions, but it is very desirable that both screen and rain gauge should be removed to more open sites.

J. A. C.

Saltburn-by-the-Sea, September 5th.—This is a new station, the outfit for which has been obtained through the Office, at the expense of Mr. Pearson, a resident in the town. The Urban District Council has provided the site and fixed the instruments, while Dr. Allen Bennett, and Mr. Pearson will conduct the observations.

The outdoor instruments have an excellent exposure on the sea front, 9 feet below the general ground level, and about 80 feet above the sea. A grass slope extends to the upper level, and winding paths lead down to the beach.

I superintended the fixing of the thermometer screen, rain gauge and earth thermometer, and I adjusted and fixed the sunshine recorder.

The sun recorder will lose a little sunshine in the early morning and late evening in winter, but I estimate that as a maximum this loss can never exceed one hour a day.

The observers are competent, and the station promises to become a very useful and interesting one.

J. A. C.

Shaftesbury, August 15th.—There was no change in the zeros of the thermometers. I recommended that the muslin round the bulb be kept tight and not baggy. I also suggested a re-arrangement of the thermometers in the screen.

W. M.

Shoeburyness, July 11th.—The barometer is to be removed from its present position, in a passage-way, into Major Jeudwine's room, the wooden case removed and the instrument kept clean. The thermometer screen and rain gauges are well exposed in an open space close to the sea, but the dry and wet bulbs are placed against the louvred back, and the bulbs flush with the bottom of the screen, 4 ft. from the ground. So far as it goes the equipment is a good one, and the sergeant-major in charge, who takes an intelligent interest in the work, is willing to undertake more complete records on receipt of the necessary forms. The responsible officers are anxious that everything should be well and correctly attended to.

H. H.

Totland Bay, July 18th.—Exposure.—Good. A hedge on the south side of the screen must not be allowed to grow taller. The Downs shelter the station on the south side, so that wind direction and force are interfered with.

Instruments.—Satisfactory. The sunshine recorder is a Campbell-Stokes instrument, in good adjustment.

Observations.—Carefully and punctually taken. Careful observations of the direction of motion of clouds are made. By standing under the tower, built on to the front of the house, and sighting the clouds against the tip of the wind vane (61 feet above the ground) good observations can be taken.

Wind velocity is determined by means of a Robinson cup-anemometer. The cups are 45 ft. above the ground, but they are sheltered by a neighbouring chimney stack and by the above-mentioned tower. The total distance travelled by the wind since the previous observation, as read off from the anemometer (factor 2·2) is divided by 24, and so the average velocity during the previous 24 hours is obtained in miles per hour. The Beaufort scale number which corresponds most nearly to this value is entered in the register. Mr. Dover does not estimate the wind force at the hour of taking the daily observations (9 a.m.),—the values given are averages for the past 24 hours.

R. G. K. L.

Truro, July 27th.—Attention was called to the fact that the returns were greatly in arrear, and Mr. Penrose promised to send in the sheets up to date without delay. The site of the instruments on the roof of the institution is not a good one, and the fact is appreciated by Mr. Penrose, who intends if possible to get a site in the park, where he hopes observations at 9 a.m. and 9 p.m. will be secured. The barometer is an old instrument which it is not easy to set accurately.

R. H. C.

Ventnor, July 18th.—Instruments.—Satisfactory.

Exposure.—Good. The high ground to the north of Ventnor influences all elements. In summer time some sunshine is lost both in the morning and the evening, but the station probably receives more sunshine than most parts of the town.

Observations.—Very good ; no weather observations are taken.

Miss Gibson was unfortunately away when I visited the station, but Miss McCulloch, who takes the observations during her absence, showed me the instruments and registers.

R. G. K. L.

Worthing, July 20th.—No change has been made in the exposure or adjustment of the sunshine recorder ; both are satisfactory. The instrument is looked after and the records are measured by Mr. King, the caretaker of the library. All the records are re-measured by Mr. Roberts or one of his assistants before sending in the weekly returns.

Records of other elements are received by the Royal Meteorological Society. I examined the barometer, thermometers and rain gauge, and compared the former two with my standards ; all the instruments appeared to be in a satisfactory condition. The readings are carefully taken. The thermometers are placed on a large lawn attached to the library, where a very fair exposure is obtained.

R. G. K. L.

Group H.—Fishery Barometer Stations.

Atherfield (*Isle of Wight*), July 17th. Barometer No. 204.

Hour of reading, about 8 a.m.

Reading at time of my visit, 30·10 ins.

Height = 116 ft. Reading reduced to M.S.L. = 30·22 ins.

Value taken from chart, about 30·17 ins.

Circumstances of exposure, &c., are precisely similar to those at Brixton (which *see*).

N.B.—Instrument is entered in books as belonging to Admiralty.

R. G. K. L.

Bognor, July 19th.—The instrument, the number of which is hardly legible (? No. 115) is in charge of the Pier Master, and it is exhibited at the entrance to the pier. It appears to be in good order. It is set every morning, but no record is kept. A copy of meteorological observations taken at a neighbouring station, which sends reports to the Royal Meteorological Society, is exhibited near the barometer.

On the day of my visit—

Fishery barometer had been set at 9 a.m. to 30·02 ins.

Reading at M.S.L. at Royal Meteorological Society station at the same hour was 30·06 ins.

R. G. K. L.

Boscastle, July 29th.—The barometer here is placed in a recess in a wall, where it was protected by a glass door, and also by a sliding wooden shutter. The glass door is however broken, and only the shutter remains, and that is also in a dilapidated state. The barometer appeared to be sound, but it is covered with dirt and cobwebs. It is hung a considerable distance back from the quay, very near the centre of the older part of the village.

I was told that about 9 fishing boats work from Boscastle, and in summer a few coasting craft use the harbour ; three were lying at the quay at the time at my visit.

Probably the present position of the barometer is as good as could be got ; but to put the box into proper order a new glass door is required, and a door on hinges should replace the present sliding shutter.

The daily weather reports are at present pushed into the same recess in which the barometer is kept, and they are not even opened out ; no attempt whatever is made to exhibit them, nor do I think anyone looks at them at all.

No storm signals have been exhibited here for a long time past. I saw the mast which was set up for the signals and it occupies a good position on the Head at the entrance to the harbour. The wire stays are however all gone, and although the pole is sound and well set up I don't think it would be safe in a strong gale, with the signal hoisted, without stays. The present procedure is for the warning to be sent to Col. Hawker, who passes it on to the Coast Guard, who in turn do nothing with it. To reach the present staff for hoisting the signal one has to cross a rather narrow and very exposed "Col," across which in rough weather the spray, &c., from the sea is blown, and it is not

always safe to venture upon it. If the "warnings" are to be continued I would like to suggest that they be sent direct to the Coast Guard, and that the signal be hoisted at the coast guard signal staff, which is in quite as good a position as the other and is always accessible. No one seemed to know where the cone is or whether it is still in existence.

I saw (at Newquay) Lieut. Ayscough, the Divisional Officer, and he thought the Coast Guard should accept no responsibility for the barometer unless it was first properly housed. Col. Hawker is a merchant in Boscastle; he was from home on the day of my visit, but I gathered from Lieut. Ayscough and others that he wished to be relieved of any further responsibility either for the barometer or storm warnings. I fear there is no likelihood of any local funds being forthcoming for the repair of the box.

R. H. C.

Brixton (Isle of Wight), July 17th.—The instrument (M. O. 206) is in charge of the chief officer of the Coast Guard station. It appears to be in good order. It is placed inside the office in a satisfactory position, but it cannot be seen by the public, and no chart of the readings is exhibited, the latter being merely entered in a note-book. The Coast Guard station is far removed from other houses, so that even if the instrument were placed in a more public position, few people would benefit from it. Occasionally the local fishermen ask the officer on duty whether the barometer is falling or rising.

The hours of observation are 8 a.m., noon, 6 p.m.

The reading at the time of my visit was 30·11 ins.; height above M.S.L., about 100 ft.: therefore reading reduced to M.S.L. would be 30·22 ins.

Value taken from chart about 30·17 ins.

R. G. K. L.

Devoran, July 21st.—The barometer hangs at the head of a staircase leading to the Subscription Reading-Room in the village, a considerable distance from the quay, and in a position where it cannot be seen by passers-by in the street, although persons who know where to find it can consult it even if they are not members of the Reading-Room. It is in charge of Mr. Pascoe, who is a postman and the hon. sec. of the Reading-Room, and who lives close at hand. The barometer was in good condition.

Devoran was never a fishing place; but some years ago when the mining industry was prosperous it had a large coasting trade, occasionally as many as forty vessels being at the quays at one time. Now at varying intervals two steamers bring coal for local use, and the rest of the trade is done by a few barges which go down the river to Falmouth; there are absolutely no fishing boats.

Although as I have said, anyone can go to the barometer, it is as a matter of fact only consulted by members of the Reading-Room, and it is as an adjunct of the Room that it now appears to be regarded.

R. H. C.

Falmouth, July 20th.—This barometer is hung inside the Custom House in a position where it is not readily accessible to the public. It is in good condition except that the key for setting it is missing, and the vernier has to be pushed up or down.

Outside the Custom House another barometer, supplied by the National Lifeboat Institution, is hung; and that is the instrument consulted by watermen and others. The Collector of Customs, in whose charge the B.T. barometer is, described the office instrument as "practically a private instrument; no one outside the Customs Staff ever examines it."

The Collector also told me that much interest is shown in the record of the pressure anemometer, which is sent daily from Pendennis, and is put up at about 1 p.m. by the side of the daily weather report. He said that both the anemogram and the report are much examined by pilots, boatmen, and others who are interested in the weather.

R. H. C.

Felixstowe Ferry, July 13th.—Station barometer M.O. 154 is in charge of Mr. Gray, chief of the Coast Guard at Felixstowe Ferry, about three miles up the coast from Felixstowe. The instrument is hung in a pump recess inside the first floor entrance to Tower U, but is useless.

It was formerly kept in the Coast Guard boat house on the beach, but in the storm of March 25, 1898, the boat house was swept away, the telescope and other things being lost. The barometer was saved, but the vernier was damaged and, no doubt, some of the mercury lost, as it now stands 0·6 in. too low. The vernier cannot be moved, and a local attempt at repair resulted in a rebuke from the Admiralty to one of Mr. Gray's predecessors, but the communication could not now be found.

Mr. Gray does not consult the barometer, and no one else ever comes to see it, there being only four pilots and a few lobster fishers in the locality.

I would, therefore, recommend that the barometer be recalled, another not being required.

H. H.

Gorey (Jersey), July 13th.—The instrument is in charge of Captain Knowles, the Harbour Master, and is placed in a prominent position in the window of his office. It appears to be in good order, but it is exposed to the sun during the afternoon. Readings are taken every morning at about 9 a.m. and

plotted on a chart, which is exhibited, together with storm-warning telegrams (if any) in a frame placed next to the barometer. Observations of wind and weather are also entered on this chart. Captain Knowles tells me that the instrument is much appreciated by the local fishermen.

Storm-warning telegrams usually reach Gorey 30 to 50 minutes after the time of issue, but occasionally evening messages are not received until the following morning; they are found to be useful.

R. G. K. L.

Gorleston, October 8th.—At the time of my visit Mr. Bammington was absent, but he had left instructions with the Lighthouse Keeper to hand me the key of the barometer case to enable me to inspect the instrument. I found the barometer clean and in good order. It is easily accessible (being fitted in a recess in the wall of the pilot house on the pier) to the fishermen and general public, and is really much referred to, especially so at the time of the herring fishery, by both the local and Scotch boats. The barometer read ·02 inch lower than the Inspector's standard (M.O. 586).

T. W. B.

Harwich, July 12th.—Fishery barometer, No. 538. B.T. 88, is in charge of Mr. W. G. Anabona, Chief Officer of the Coast Guard. The instrument is in good order, in a large pent-roofed box fixed against the tarred wall in the yard of the Coast Guard building, facing the sun in the early morning. It requires a correction of +0·1 in., but for a publicly exposed instrument it reads nearly correct, the + 0·1 being mainly due to the temperature reduction. Its indications, without the attached thermometer, are entered in the log daily at 9 a.m., noon, 3 p.m., and midnight. Two panes of glass are let into the face of the case, so that both the height of the barometer and the attached thermometer can be read off.

Many pilots, fishermen, the masters of small craft and of wind-bound vessels frequently come to see what the barometer is doing, so it is evident the instrument supplies a want in the locality.

Mr Anabona will in future record the attached thermometer in his log.

[On questioning Mr. Mills, chief of the Felixstowe (Landguard) Coast Guard, he informed me that he is often called upon to communicate by signal to H.M. ships passing the station the latest weather reports, weather forecasts, barometer and thermometer readings, &c. He always telephones to Harwich for the barometer readings as he is not supplied with a barometer at his station. His supposition is that the information is asked for from the ships to keep himself and his men well up in signalling work.]

H. H.

Haslar Hospital, July 19th.—The instrument, M.O. 147, is in charge of the Police; it is placed in the porch of the main gate and appeared to be in good order. Readings are taken at 8 a.m., 2 p.m., 8 p.m., and 2 a.m. and are sent to the Office. At the time of my visit the instrument read 30·09 ins., while my standard (M.O. 964) read 30·11 ins. So far as I was able to ascertain the instrument is not consulted by the public. I was told that the hospital also possesses a self-registering aneroid.

R. G. K. L.

Hayle, July 27th.—The barometer is in very good order and is kept in a box set in the wall of the Custom House, where it can be consulted by anyone, and where it is passed by shipping masters and others on their way to and from the Harbour Office. It is in charge of Mr. R. Graham, the Principal Officer of Customs, who sets the index daily, and looks after the instrument very carefully. I was told that the barometer is very much used.

The staff for exhibiting the signal cone is opposite the Custom House, in a very good position for the signal to be seen; and Mr. Graham says the warnings are greatly valued. The staff is not, however, in good repair. After much trouble Mr. Graham got the Harbour Authorities to do something to it recently, and the signals can now be hoisted, but for some time that could not be done, and even now the pole is imperfectly stayed. The telegram is exhibited in the window of the Custom House.

Mr. Graham appears to have taken a good deal of trouble in this matter of the signals—which is quite outside his regular duties—and I would like to suggest that a letter of acknowledgment should be sent to him.

R. H. C.

King's Lynn, Alexandra Dock, July 15th.—Station barometer N. and Z., M.O., 195, remains in the care of Mr. A. G. Russell, the Dock Manager. Formerly it was suspended at the Dock Head, but in accordance with the Inspector's suggestion in 1888 it was removed to the Dock entrance gate. Here, however, it was found that the constant slamming of the gates disturbed the mercury, and it was thought best to fix it on the side of the Police Office, a few feet away. This proved an unsatisfactory position, as the sun was shining on the instrument most of the day. Then it was shifted to its present position at the entrance to the Dock Master's office, close to the Police Office. Even here it is affected by the sun during some parts of the day, but it is difficult to find a place in the Dock which would not be equally objectionable.

About ten years ago Mr. Ellison, the Deputy Dock Master (the Berthing Master)—who sets the vernier about noon daily, and keeps a monthly barometer diagram chart, with wind direction and force—recording the attached thermometer in the "Dry" column when the weather is fine, and in the "Wet" column when the weather is rainy!—tilted the instrument up to clean it, and in some way

rendered it useless. It was sent up to M.O. to be refilled, and to-day, with the attached thermometer at 82° the reading agreed with the Inspector's, No. 963—29·99 in. Whipple's Kew correction of 1886, however, has been allowed to remain on the front of the instrument :—

27 in.	29 in.	31 in.	
— ·007	— ·008	— ·010	att. ther. at 60°0.

All the mariners and others about the Docks come to see the instrument and take great interest in it, considering it to be very accurate in its indications, except when it changes very rapidly. Mr. Russell's last expression was : "The instrument is so much appreciated here that, whatever you report, please do not suggest that it should be removed from Lynn."

H. H.

King's Lynn, Custom House, July 15th.—The fishery barometer at King's Lynn Custom House has only the maker's number, 380, on it, but the official number, M.O. or B.T., given by Mr. Wallace, is 82.

The instrument is in the care of the Collector of Customs, now Mr. W. R. Twitchett, and the vernier is set every morning by the Deputy Collector, but no records are kept. It is suspended in the long room of the Custom House, on the wall facing the entrance into the room, and above it is inscribed, in large lettering :

"THIS BAROMETER IS LENT BY THE BOARD OF TRADE FOR THE USE OF THE SEAFARING COMMUNITY OF LYNN."

Every day it is consulted by many of the sailors and fishermen in port, and both the Collector and his deputy agree in saying that it is greatly appreciated by the class of people for whom it was intended to be of use. A suggestion was made many years ago [probably on the occasion of the official visit in 1888] that it would, perhaps, attract more attention if transferred to another position near where the boats anchor, but as masters and officers of the various craft visit the Custom House long room it has not been deemed necessary to alter the position. Should the question of shifting it again arise the best place would be outside the Custom House, on the wall, between the entrance and the advertisements of official notices, where it would face north, out of the sun's rays, and all persons passing to and fro between the town and the harbour could not help seeing it—but a glazed case would be necessary to protect it.

Comparison.—29·95 in., att. ther. 82° Inspector's, No. 963, 29·94 in., att. ther. 81°.

H. H.

Leigh (Essex), July 18th.—Fishery or station barometer M.O. 174 is in the care of Mr. James Collins, Station Officer of the Coast Guard. The instrument, in a windowed case, is suspended on the south wall of the Coast Guard watch room, exposed to the sun's rays all day. On my arrival the attached thermometer was already up to 98°, and the men informed me that the usual height reached daily in sunny weather exceeds 110°. I had the instrument taken into the watch room and left it there to cool while I went round with Mr. Collins to see if a better place was available for suspending it where it would be easily accessible to the fishermen of the locality, who up till now have hardly seen the barometer, owing to the Coast Guard watch room being in an awkward place to get at, across the railway lines. In the absence of any more substantial and suitable place I selected the north end of what is known as the Oyster Shed, on Bell Wharf, where all the fishermen congregate. Two of the principal men on the wharf promised to obtain the sanction of the owner of the shed—not at home to-day—and to take measures for having the barometer properly suspended under the supervision of Mr. Collins. The shed is only about 100 yards distant from the watch room. The fishermen who, having business with the Coast Guard, have seen the barometer a few times, express themselves very favourably about it, "as it is always very correct in foretelling the weather, and ought to be down here on the wharf where we can always have a look at it." Mr. Collins has from the first (he came here 14 months ago) favoured its removal, but did not like to interfere with it. The instrument is in good condition, reading 30·39 in., att. ther. 76°, against my barometer, 30·38 in., att. ther. 73°—corrected for temperature, both 30·26 in.

H. H.

Margate, July 21st.—The instrument, No. 619, B.T. No. 92, is exhibited in the porch of the Seamen's Institute in a very satisfactory position. It is in charge of the curator, who sets it every morning, but no record of the readings is kept. It appears to be in good order, and is much consulted.

I took the following readings :—Fishery barometer,, 619, 30·07 ins.; my standard, M.O. 964, 30·07 ins.

R. G. K. L.

Orford Haven, July 12th.—At Harwich I communicated, by telephone, with Orford Haven Coast Guard, to ascertain the nearest railway station—which is Melton, 9 miles distant. I was told that there has been no barometer at Orford Haven for many years—"it was done away with years ago." This information was confirmed by one of the Harwich Coast Guard men, formerly at Orford Haven, who says that there has not been a barometer at the station for years, that since its removal the observations were taken at Hollesley Bay Training College. On this information I did not feel justified in attempting the long journey to make a personal investigation without further instructions.

H. H.

Penryn, July 21st.—The barometer is suspended in a case outside the room used by the Customs Officer, at the head of a short flight of steps. It is well protected from the weather except that the sun shines upon it during the early part of the day, but it was very dusty and dirty when I saw it.

The Customs here are under the charge of the Collector at Falmouth, so that presumably the barometer is in his custody.

There are no fishing boats at Penryn and only a few coasters use the place, the number depending chiefly upon the state of the granite trade. The quay-men use the barometer at times, but they do not go afloat, and "most of the coasters have a barometer or aneroid on board."

The Customs Officer comes to Penryn from Falmouth, and he had not arrived when I left Penryn; I had therefore to get my information respecting the barometer from a man in an office at the base of the steps, and from enquiries made on the quay.

R. H. C.

Portscatho, July 20th.—This instrument was recently moved from its original position to the doorway of "The Institute," where it is under the care of the hon. sec., Mr. W. Finlay Hamilton.

The instrument is in good condition. It hangs upon the wall in a good position for being seen, but the sun shines full upon it for some hours near midday.

There is very little fishing done from this place now, and only four men there can be regarded as "fishermen" working at fishing for a living. In summer, several boats are in use for visitors' trips.

I gathered that some opposition had been manifested to the removal of the barometer from the old "Reading Room and Boatmen's Shelter" to the new "Institute"; but in its present site it is well looked after, and is "set" each morning by the caretaker, and it is but a few yards away from where it was.

R. H. C.

Ryde (Isle of Wight), July 18th.—The instrument [No. 285 ? 46 ? (no M.O. number)] is placed on the pier-head and appears to be in a satisfactory condition. It is set every morning, but the readings are not recorded, as a record of an aneroid barometer at the other end of the Pier is kept up by the Coast Guard. I also noticed another mercury barometer, exhibited for public use by an optician, close to the Pier.

Reading at 9 p.m., 30·14 ins.; reading at 6 p.m. at M.S.L., taken from chart, about 30·15 ins.

R. G. K. L.

North Shields, September 1st.—This fishery barometer, No. 99, is exposed on the Fish Quay outside the Quay Master's Office. It is in a wooden case affixed to the wall of the house. The case has a glass door, which is kept locked, Mr. McKenzie, the Quay Master, having the key.

The attached thermometer has been stolen. With the exception of some tiny globules of mercury in the upper part of the tube, the instrument was in good order, but on comparison with my standard it read 0·05 inch too low.

Mr. McKenzie would like a supply of Form No. 15 on which to exhibit the barometer diagram. I promised these should be sent.

I was told that the instrument is constantly being consulted by the fishermen and others, and that it is found to be of great service. There is evidence that considerable use is made of it at night time, in the marks upon the wall where matches have been struck.

J. A. C.

South Shields, September 1st.—This fishery barometer hangs in the inner lobby of the Mercantile Marine Office, which is on the Mill Dam Quay, some distance from the mouth of the Tyne.

The inner lobby is separated from the outer lobby by swing doors, which are usually shut. At night the outer doors are closed, and from that time no one except those in the house can consult the barometer.

The Mercantile Marine Office is a public office, and those persons who know of the existence of the barometer can, during the day, come and consult it. I was informed that the boatmen on the quay (there are practically no *fishermen* there) did know about the instrument, and did consult it from time to time.

The instrument is in good order. It read 0·02 inch lower than my standard.

J. A. C.

Sunderland, September 3rd.—This barometer, No. 148, is in the custody of the Coast Guard. I found it hanging inside the boat-house, and quite inaccessible to ordinary members of the public. I was informed it had been in the same position for upwards of twenty years.

The Coast Guard station is being transferred to Roker, on the other side of the river, and I herefore dismounted the instrument and conveyed it to the new station.

I selected a new site for it where it can be seen by boatmen and others, and Mr. Parkes, the Chief Officer of the Coast Guard at the station, believes that in its new position it will prove of great service to the local men.

Mr. Parkes promised to have a glass-fronted case made to protect the instrument, and I arranged that till this case was ready the barometer should be kept in the watch house.

I compared the barometer with my standard after its removal to the new station and found it to be correct.

J. A. C.

Ventnor, July 18th.—The instrument, M.O. 118, is in charge of Mr. J. W. Blake, bathing machine and boat proprietor. It is placed on the north side of a specially constructed pedestal on the Marine Parade. Readings are taken every morning and plotted on a chart, which is exhibited together with the Daily Weather Report. The instrument appeared to be in good order: it read 30·27 ins.; the reading of my standard (M.O. 964) was 30·29 ins.

R. G. K. L.

Wells, Norfolk, July 14th.—Fishery barometer, B.T. 82, on the occasion of the previous visit, in 1888, was looked after by Mr. Goddard, a clerk in the employ of Messrs. J. & R. Marriott, merchants. On being informed that both Mr. Goddard and Messrs. Marriott had left the town years ago, I placed myself in communication with Lieut. Beaumont, R.N., the Officer in charge of the Coast Guard along the north coast of Norfolk. Immediately, and at considerable inconvenience to himself, he set about to discover who could now be in charge of the instrument, as it was not in possession of the Coast Guard.

It appears that on leaving Wells, Mr. Goddard transferred the custody of the barometer to Captain William Temple, the Harbour Master, and about four years ago the latter passed it on to Mr. E. B. Southgate, butcher, Freeman Street, Wells, who has since kept the key of the case in which the instrument is suspended against the outside wall of Messrs. R. & G. Smith's office, facing northward to the quay wall.

It is good order, about 0·03 in. below the standard, is set (not read) every morning by Mr. Southgate, between 9 and 10 o'clock, and on a slip of paper placed inside is noted, as to-day, "Thursday, July 14th, 1904, set at 9.35 a.m."

I saw Captain Temple (who should be regarded as in charge), Mr. Southgate, and some of the sailors about the quay, and they all agreed that the barometer is most highly appreciated by sailors, fishermen and the public, being regarded as one of the "institutions" of Wells. Should Mr. Southgate be late in coming to set it, people are sure to come to remind him, "and I have never been presented with so much as an ounce of baccy for all the trouble I have taken." I was asked not to take the barometer away from them.

H. H.

Yarmouth (Isle of Wight), July 17th.—The instrument, M.O. 5079, is in charge of the Harbour Master (not Coast Guard). It is placed in a case on the north wall of the office, where it is protected from sunshine till after 6 p.m. Daily readings are taken at about 10 a.m. (1 p.m. on Sundays), and plotted on a chart, which is exhibited next to the instrument. Observations of weather and wind are also entered on the chart. The instrument appeared in good order, but its reading was rather high—30·43 ins. The reading at M.S.L. (taken from working chart) was probably about 30·18 ins. The instrument is frequently consulted by the local boatman and also by the owners of yachts. Storm warnings are received at this station; the telegrams are exhibited in a screen placed near the barometer. They usually arrive about half an hour after the time of issue, but occasionally messages sent in the evening are not received till next morning.

R. G. K. L.

Group T.—Telegraphic Reporting Stations.

Aberdeen, August 3rd.—All the instruments were in excellent order. The new observer, Mr. Clarke, has entered on his duties with much intelligence, and is a painstaking and correct observer. Professor Niven was present during the greater part of the inspection.

A. B.

Bath, August 6th.—Dr. Symons was absent from Bath, and the assistant who takes the observations was also away on a half-holiday, and had the keys with him. I was therefore unable to see the instruments, and could do no more than call the attention of the assistant whom I saw to the several points where irregularities had apparently occurred, especially the measurements of the sunshine records, and the frequency of errors in the 8 a.m. reports. I was assured that attention should be paid to these matters in the future.

R. H. C.

Bidston Observatory, August 11th.—Everything here was in a very satisfactory condition.

Mr. Plummer was away at the time of my visit, but his assistant, Mr. Skinner, afforded me every facility for testing the instruments, and gave all the necessary information for completing the inspection.

Observer was requested, in future, to supply details respecting the time of commencement and ending of gales, in the form prescribed in Instructions for Meteorological Telegraphy.

F. J. B.

Blacksod Point, September 13th.—Mr. J. Heddon, Chief Officer of Coast Guard, is now the observer at this station, S. Bonner acting as his assistant. With the exception of one thermometer, the porcelain mounting of which is broken, the instruments are in good order, but the thermometer screen requires mending. The grass under the screen and that round the rain gauge is too long. The barometers are not well situated for taking observations, but Mr. Heddon assisted me in selecting better positions, and will have them moved. He says he will have the thermometer screen repaired at once, and the grass under screen and round gauge cut, and kept short. The station is somewhat sheltered by a hill from winds between S. and W.N.W., and it is therefore not possible at times to estimate the force and direction of the true wind for the neighbourhood when it comes from between those points, but the observer intends to obviate that difficulty by making his observations from the hill's summit.

Mr. Heddon did not commence observing for the Office until last July; he is, however, an efficient observer.

C. H.

Clacton-on-Sea, July 12th.—The thermometer screen, grass minimum, and rain gauge, are on the north-eastern slope of the mound on which a martello tower (Coast Guard) stands, and are all well exposed. The sunshine recorder is on the tower, and the exposure is very good, but recently a flagstaff has been erected, interfering slightly with the record—the staff and one of its stays being shown in the photographic recorder.

The instrumental equipment is excellent, and the observer appears to be most careful in obtaining accurate readings.

H. H.

Donaghadee, September 7th.—Since I inspected this station in August, 1903, Mr. M. Busby, who was then the observer, has left, and Mr. Robert Damerell, for a considerable time his principal assistant, has succeeded him.

Mr. Damerell was much interested in and thoroughly conversant with the work before he took charge, and his assistants, six in number, have all been trained to observing by him.

I found the instruments in good order; they have evidently been well cared for. Owing to the high land which rises to south-westward of this station, and forms a shield, the strength of the wind from south-westward in the neighbourhood of the station may be under estimated by the observers at the station, although they are aware of the fact, and make some allowance, I believe, for it.

C. H.

Dungeness, July 21st.—Exposure.—Good. The barometers have been moved to the new light-house, where they have been placed under the staircase. The instruments are well protected from heat or accident, but the light is not very good: reading is greatly facilitated by shading the eyes so as to cut off reflected light; if this is done satisfactory observations can be obtained. The new thermometer screen has been fixed in the old position. The site is rather close to (about four yards from) observer's house, a low dark-red building, about to be painted white. The legs of the screen are firmly fixed in a bed of cement. The weeds round the rain gauge had been allowed to grow too high.

Instruments.—Satisfactory, except rain gauge. The funnel of the latter leaks slightly; a new instrument is needed. There are no spare thermometers. The new rain water tanks are lined with cement, so that water in them becomes hard; there was consequently a thick deposit on the wet bulb I have requested observer to save up the water from the rain gauge and use it for moistening the wet bulb. Barometrical correction appears to be greater than +·01.

Observations.—Good. The deputy observer needs practice in setting the barometer.

R. G. K. L.

Jersey (St. Aubin's), July 13th.—Exposure.—No changes; very fair.

Instruments.—Satisfactory; but the thermometer screen is getting worn out. Many of the inner louvres are loose, and as the wood is rotten they are difficult to fix. The outer ones are all firm, and the instrument is at present satisfactory.

Rain gauge—Base of the outer copper vessel was detached. Mr. Fisher will have this soldered on again. The woodwork which supports the gauge is getting rotten, and will probably fall to pieces when the gauge is taken out for the above repairs to be carried out. I have sanctioned the fixing of the gauge in a cement pedestal already prepared for it.

R. G. K. L.

Jersey (St. Helier's).—Sunshine recorder.—The post on which this stood was rotten. I had a new one put up, and refixed the instrument on it.

Observations.—Carefully and accurately taken. R. G. K. L.

Leith, July 26th.—The instruments were all in excellent order, and the two observers made the observations readily, intelligently and correctly.

A. B.

Malin Head, September 9th.—Mr. J. Putt, who is now again in charge of Lloyd's signalling station at Malin Head, is an old observer for the Office, having been in charge of the station in 1899 and 1900. He appears to take a keen interest in the work of observing, and a pride in doing it thoroughly, and with efficiency. I found the instruments in good order and quite clean; the screen had been painted recently; and Mr. Putt's report to the Office was copied carefully and neatly from his register, up to date.

I explained to Mr. Putt the requirements of the Office in regard to information relating to gales; their times of commencing and ending; and also asked him to record the extreme force of the wind observed. He will attend to these items in future.

C. H.

Nairn, August 23rd.—The instruments were in very good order, and the observer, Miss Janette Penny, who was on duty during the time (Miss Penny being on holiday), is a remarkably good and intelligent observer.

A. B.

Nottingham, September 15th.—The arrangements at this station are excellent, and the work is carried out with care and intelligence. Mr. Brown, the city Engineer, through whom the station was established, continues to take a keen interest in the observations, and Mr. Ings is a competent observer. The thermometer screen, which at the date of last inspection was supported on one central post, and was not rigid, is now quite firmly fixed. The barometer house is apt to be unduly heated in the afternoons. I suggested that a square of perforated zinc might be inserted in its northern side, and it was promised this should be done. The sunshine recorder has been shifted to a winter position, it being found that the engine house would cut off some sunshine unless the instrument was removed. The adjustment was accurate; the exposure is good, and, with the exception of a possible *slight* loss in the late winter afternoon, the instrument will record all the bright sunshine experienced at the station.

Mr. Brown has had a Dines anemometer, and a Halliwell rain gauge installed at the station. Both instruments are working satisfactorily. The records are filed at the Guildhall, and Mr. Brown will be pleased to allow the Office access to them if desired.

J. A. C.

Roche's Point, September 20th.—In charge of a post office, which is also a telegraph office in connection with an important signal station, and with no one to help him with his duties but a lad of about 14 years of age, Mr. Fitzmahony, the observer, carries on his work for the Council with some difficulty, but with a considerable amount of success. Comparatively new to the work as he is I found him anxious to obtain any hints in regard to the requirements of the Meteorological Office that I could give him, and glad to carry out any suggestions I made. I believe him to be a painstaking and reliable observer. During winds from between west and north-east round by south, wind observations are unreliable, except when taken from the hill top. I am told it is the intention of the Harbour Commissioners to erect an anemometer on the hill near the flagstaff, but I could not ascertain anything definite in the matter.

C. H.

Scilly, July 26th.—The condition of the instruments at this station was, upon the whole, satisfactory, and I believe the observer is careful in making his observations. Attention was called to the need for making more use of the aneroidograms and for reporting the extreme force in gales. The thermometer screen, and the enclosing rail around the rain-gauge, require some slight repairs.

R. H. C.

Shields, North, September 1st.—There has been a change of observer here since the last inspection, but Mr. Moat, the new observer, has had long experience as assistant to the two previous observers, and is quite competent.

The thermometer screen has been repaired and repainted and is now satisfactory, though it is one of the old and small pattern. The rain-guage is also quite satisfactory, but it is loose in its hole and I asked that it might be firmly fixed.

I impressed on both observers the importance of punctuality in taking the readings.

J. A. C.

Skegness, September 14th.—I found everything in very good order, the observers are careful and intelligent, and the work appears to be very well done. The new maximum thermometer supplied in July last is working satisfactorily.

The sunshine recorder was removed in June last from the pier head to the top of the switchback railway on the sea front. The new position is an admirable one, and is much more convenient of access since the pier is 600 yards long, and to change the card often necessitated a walk of two-thirds of a mile. The adjustment of the instrument was not quite correct as regards meridian. I therefore relieved the clamps and made the required alteration.

The position of the thermometer screen and rain-gauge is excellent. Mr. Coetmore Jones, however, proposes to transfer the instruments to an exactly similar position about 300 yards further south, to a part of the front less frequented by children. The results from both positions would be identical.

To avoid discrepancies between the publications of the Office, I asked that the maximum temperatures read at 6 p.m., which are those published in the Daily Weather Report, might be inserted in the monthly schedule in future in preference to those made at 7 a.m. which are sent to the Seewarte, Hamburg.

J. A. C.

Spurn Head, September 8th.—A new thermometer screen has been supplied to this station since last inspection, and this has been fixed about 5 yards from the former position. The change has been satisfactorily carried out by the observer, and it is a decided improvement. The rain-gauge is placed 3 ft. 5 in. above the ground, to prevent the sand blowing into it. The observer had not been reporting the extreme wind quite correctly. I gave directions as to this, and also as to the agreement that should exist between the maximum and minimum readings and the dry-bulb. The observer set the barometer 0·02 in. too high at first, but on further trials his readings were correct. He is a good deal interested in the work, and is anxious to do well.

J. A. C.

Stornoway, August 17th.—The instruments were all in good order, except the minimum thermometer which was, as compared with the maximum thermometer, about half a degree lower than last year—a defect not apparently due to evaporation of part of the spirit toward the top of the tube. Mr. McKenzie appears to give much time and attention to the observations, especially to the wind.

A. B.

Sumburgh Head, August 10th.—All the instruments are remarkably well taken care of and the observers make the ordinary and extraordinary observations intelligently and correctly.

A. B.

Wick, August 16th.—Mr. James G. Sinclair, son of Mr. J. Sinclair, has for some months taken a large part in the observations. He is upwards of 20 years of age, well understands the work, and is particularly intelligent. This addition to the staff points to fuller observations regarding storms and greater attention to the correspondence of the office.

A. B.

Yarmouth, October 7th.—The instruments were all found to be in good working order, excepting that the trace of the self-recording aneroid had become thick and blurred. On examination I found that the pen had become very much worn ; a new pen was fitted to the index arm and the trace on the following morning showed a decided improvement.

The barometers and thermometers were duly examined.

T. W. B.

Comparison of Instruments.

The following tables give the corrections required to be applied to the readings of the various instruments to make them agree with the Inspector's standards :—

Barometers.

Observatories.

Station.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	Remarks.
England and Wales.	Inches.	Inches.	Inches.	
Falmouth	29·825	+ ·003	—	
Kew	—	—	—	
Oxford	—	—	—	
Stonyhurst	29·544	+ ·005	—	Mean of 6 comparisons.
Scotland.				
Aberdeen	—	—	—	
Ben Nevis	—	—	—	
Fort William	29·697	− ·005	—	
Glasgow	—	—	—	
Ireland.				
Armagh	29·599	·000	—	Mean of 5 comparisons.
Valencia	—	—	—	

BAROMETERS.

TELEGRAPHIC REPORTING STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Bath	—	—	—	Not compared this year.
Clacton-on-Sea	30·101	− ·005	—	
Dungeness	30·091	+ ·016	+ ·021	
Holyhead	—	—	—	No comparison made.
Jersey	30·294	+ ·002	+ ·012	
Liverpool (Bidston) ...	29·667	+ ·002	—	
London (Brixton) ...	—	—	—	Not inspected this year.
Nottingham	29·995	+ ·001	− ·013	
Oxford	30·000	− ·001	—	Mean of 9 comparisons.
Pembroke	—	—	—	Not visited this year.
Portland Bill	—	—	—	Not visited this year.
Scilly	29·820	− ·004	·000	
Shields, North	29·995	+ ·003	+ ·003	
Skegness	29·809	− ·009	—	
Spurn Head	30·001	+ ·005	+ ·009	
Yarmouth	29·667	− ·001	+ ·003	
SCOTLAND.				
Aberdeen	29·484	− ·008	− ·011	
Leith	29·879	− ·005	− ·005	
Nairn	30·162	− ·003	− ·003	
Stornoway	30·049	− ·007	− ·003	
Sumburgh Head... ...	29·755	− ·005	− ·003	
Wick	29·360	·000	− ·010	
IRELAND.				
Birr Castle	—	—	—	Not visited this year.
Blacksod Point	29·732	+ ·004	− ·019	
Donaghadee	30·096	+ ·008	− ·004	
Malin Head	29·604	+ ·002	+ ·018	
Roche's Point	30·234	+ ·053	+ ·052	Comparisons made with an aneroid—Inspector's mercurial barometer broken.
Valencia	30·320	+ ·007	—	

NORMAL CLIMATOLOGICAL STATIONS (Second Order Stations, International Classification).

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Aspatria	29·746	+ ·003	—	
Bettws-y-Coed	30·033	+ ·009	—	
Cardiff	—	—	—	Not tested.
Carlisle	29·887	+ ·035	—	
Castletown, Isle of Man ...	30·311	+ ·002	—	
Clacton	30·101	− ·005	—	
Cockle Park	29·740	·000	—	
Cronkbourne	30·191	+ ·007	—	
Dunmow	29·816	+ ·010	—	
Fulbeck	29·817	+ ·004	—	
Garforth	29·849	+ ·012	—	
Geldeston...	30·175	+ ·006	—	
Guernsey	29·898	+ ·008	—	
Hull	30·063	+ ·012	—	
Lincoln	30·053	− ·003	—	
Manchester, Oldham Rd.	30·085	·000	—	
Manchester, Whitworth Park.	30·062	+ ·008	—	Mean of 7 comparisons.
Monmouth	30·025	+ ·010	—	
Oundle	30·093	− ·011	—	
Plymouth...	29·984	+ ·005	—	

BAROMETERS.—*continued.*

NORMAL CLIMATOLOGICAL STATIONS (Second Order Stations, International Classification).—*cont.*

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES—*cont.*	Inches.	Inches.	Inches.	
Prestwich	29·892	− ·006	—	
Salisbury	29·884	·000	—	
Shrewsbury	30·052	− ·008	—	
Southampton	30·017	− ·001	—	
Stokesay	29·793	+ ·008	—	
Whitby	29·768	+ ·008	—	Mean of 2 comparisons.
SCOTLAND.				
Balruddery	29·530	+ ·015	—	
Cally	29·335	− ·011	—	
Cargen	29·722	+ ·016	—	
Crathes	29·746	− ·005	—	
Deerness	29·830	− ·020	—	
Dundee	29·950	·000	—	
Dunrobin	29·984	+ ·002	—	
Fort Augustus	29·933	·000	—	
„ William	29·697	− ·005	—	
Lairg	29·436	+ ·016	—	
Laudale	30·072	·000	+ ·012	
Ochtertyre	29·393	− ·012	—	
Poltalloch	29·730	+ ·014	—	
Rothesay	29·804	− ·002	—	
Wolfelee	29·288	− ·002	—	
IRELAND.				
Armagh	29·599	·000	—	Mean of 6 comparisons.
Ballinacurra	—	—	—	Standard bar broken.
Dublin, Phœnix Park ...	29·927	− ·003	—	Mean of 5 comparisons.
„ Trinity College	—	—	—	Standard bar broken.
Glasnevin	—	—	—	do.

OTHER CLIMATOLOGICAL STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Barnet	29·834	− ·022	—	
Barnstaple	30·236	+ ·102	—	
Buntingford	29·80	+ ·30	—	Read to hundreths only.
Coventry	29·903	+ ·013	—	
Leeds	—	—	—	Not compared.
Llangammarch Wells ...	29·616	− ·015	—	
Maidenhead	30·071	+ ·006	—	
Newquay	30·017	+ ·020	—	
Nottingham Castle ...	29·869	+ ·005	—	
Portsmouth	30·139	+ ·018	—	
Preston	29·892	+ ·006	—	
Reading	29·885	+ ·021	—	
Rugby	29·909	+ ·011	—	
Saltburn	29·803	+ ·003	—	
Shoeburyness	30·201	+ ·013	—	Mean of 2 comparisons.
Totland Bay	30·189	+ ·026	—	
Truro	30·050	+ ·020	—	
Ventnor	30·175	+ ·014	—	
Worthing	30·049	+ ·001	—	
SCOTLAND.—None.				
IRELAND.—None.				

THERMOMETERS.

OBSERVATORIES.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Earth Thermometer.		Spare.
							1 ft.	4 ft.	
ENGLAND AND WALES.	°	°	°	°	°	°			°
Falmouth	62·2	−0·6	0·0	−0·5	0·0	—	—	—	—
Kew	—	—	—	—	—	—	—	—	—
Oxford	58·7	−0·3	−0·3	−0·4	+0·1	+0·5	—	—	—
Stonyhurst	58·5	−0·1	0·0	−0·1	+0·5	+0·5	—	—	—
SCOTLAND.									
Aberdeen	51·7	−0·2	−0·7	−0·1	+0·3	—	—	—	—
Ben Nevis	—	—	—	—	—	—	—	—	—
Fort William	52·4	0·0	−0·1	0·0	−0·1	—	—	—	—
Glasgow	56·2	−0·2	−0·1	0·0	+0·2	0·0	—	—	—
IRELAND.									
Armagh	56·2	−0·4	−0·5	−0·1	+0·1	0·0	—	—	—
Valencia	56·0	−0·6	−0·5	−0·1	0·0	—	—	—	—

TELEGRAPHIC REPORTING STATIONS.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Earth Thermometer.		Spare.
							1 ft.	4 ft.	
ENGLAND AND WALES.	°	°	°	°	°	°			°
Bath	—	—	—	—	—	—	—	—	—
Clacton-on-Sea	65·6	0·0	0·0	− 0·4	+ 0·4	+ 0·4	—	—	—
Dungeness	65·2	− 0·4	− 0·3	− 0·5	− 0·4	—	—	—	—
Holyhead	—	—	—	—	—	—	—	—	—
Jersey	73·7	− 0·1	− 0·1	+ 0·4	+ 0·1	—	—	—	− 0·2
Liverpool (Bidston) ...	62·4	+ 0·1	− 0·3	− 0·3	− 0·4	—	—	—	− 0·6
London (Brixton) ...	—	—	—	—	—	—	—	—	—
Nottingham	60·0	0·0	0·0	− 0·1	+ 0·1	—	—	—	− 0·1
Oxford	58·7	− 0·3	− 0·3	− 0·4	+ 0·1	+ 0·5	—	—	—
Pembroke	—	—	—	—	—	—	—	—	—
Portland Bill	—	—	—	—	—	—	—	—	—
Scilly	72·5	− 1·0	− 0·5	+ 0·3	+ 0·1	—	—	—	− 0·3
Shields, North	60·3	− 0·3	− 0·6	− 0·5	+ 0·3	—	—	—	—
Skegness	57·4	− 0·4	− 0·4	− 0·2	+ 0·1	—	—	—	—
Spurn Head	61·5	− 0·5	− 0·1	0·0	− 0·5	—	—	—	− 0·2
Yarmouth	54·5	− 0·2	− 0·3	− 0·2	+ 0·5	—	—	—	—
SCOTLAND.									
Aberdeen	55·7	0·0	− 0·1	− 0·1	0·0	—	—	—	—
Leith	61·1	0·0	− 0·1	0·0	+ 0·2	—	—	—	—
Nairn	55·5	+ 0·2	+ 0·2	+ 0·1	+ 0·3	—	—	—	+ 0·1
Stornoway	56·2	+ 0·1	+ 0·2	0·0	+ 0·8	—	—	—	+ 0·3
Sumburgh Head	52·8	0·0	+ 0·1	− 0·1	+ 0·1	—	—	—	− 0·3
Wick	58·7	0·0	0·0	− 0·1	+ 0·3	—	—	—	− 0·4
IRELAND.									
Birr Castle	—	—	—	—	—	—	—	—	—
Blacksod Point	54·8	− 0·3	− 0·1	− 0·3	+ 0·4	—	—	—	− 0·2
Donaghadee	59·1	0·0	− 0·8	+ 0·1	+ 0·6	—	—	—	− 0·5
Malin Head	54·0	0·0	0·0	0·0	+ 0·9	—	—	—	− 0·2
Roche's Point	57·9	− 0·4	− 0·4	+ 0·1	+ 0·3	—	—	—	—
Valencia	55·8	0·0	0·0	− 0·4	+ 0·1	—	—	—	0·0

THERMOMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Stations, International Classification).

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Earth Thermometers.		Spare.
							1 ft.	4 ft.	
ENGLAND AND WALES.	°	°	°	°	°	°			°
Aspatria	65·4	+ 0·2	+ 0·1	− 0·4	+ 0·4	+ 0·1	—	—	—
Bettws-y-Coed	59·5	0·0	0·0	− 0·1	+ 0·1	+ 1·6	0·0	0·0	—
Cardiff	—	—	—	—	—	—	—	—	—
Carlisle	58·7	− 0·4	− 0·4	− 0·8	− 0·3	− 0·1	—	—	0·0
Castletown, Isle of Man	65·9	− 0·1	− 0·1	− 0·3	− 0·2	+ 0·9	—	—	—
Cheltenham	63·0	− 0·3	− 0·5	− 0·6	+ 1·5	+ 0·7	—	—	—
Clacton	65·6	0·0	0·0	− 0·4	+ 0·4	+ 0·4	—	—	—
Cockle Park	57·5	− 0·3	− 0·2	− 0·6	+ 0·9	− 0·3	—	—	—
Cronkbourne	61·2	− 0·7	− 0·7	− 0·2	+ 0·4	0·0	—	—	—
Cullompton	59·0	− 0·3	− 0·5	0·0	+ 0·3	+ 0·5	—	—	—
Dunmow	57·7	− 0·1	− 0·1	− 0·3	+ 0·1	+ 0·2	—	—	—
Fulbeck	59·0	0·0	− 0·5	0·0	0·0	—	—	—	—
Garforth	60·9	− 0·1	− 0·1	− 0·2	− 0·1	− 0·2	—	—	—
Geldeston	60·5	− 0·5	− 0·8	− 0·7	+ 0·2	—	—	—	− 0·6
Guernsey	66·8	− 0·3	− 0·3	− 0·4	0·0	+ 0·4	—	—	—
Hull	57·4	− 0·8	− 0·7	− 0·3	+ 0·1	+ 1·0	—	—	—
Lincoln	57·0	− 0·5	− 0·3	0·0	0·0	—	0·0	0·0	—
Llandudno	58·0	− 0·2	− 0·2	0·0	+ 0·1	—	—	—	—
Manchester, Oldham Road	64·9	− 0·1	− 0·1	0·0	− 0·1	− 0·1	+ 0·2	+ 0·2	—
„ Whitworth Park	61·6	− 0·2	− 0·3	+ 0·4	+ 0·4	+ 0·5	− 0·1	0·0	—
„ Prestwich ...	65·6	− 0·5	− 0·4	+ 0·4	+ 0·2	+ 0·4	—	—	—
Monmouth	68·2	− 0·6	− 0·5	− 0·4	− 0·2	+ 0·1	—	—	—
Oundle	76·9	− 0·1	− 0·1	− 0·1	+ 0·1	+ 0·1	—	—	—
Plymouth	63·8	− 0·2	− 0·5	− 0·2	− 0·1	—	—	—	—
Rousdon	61·0	− 0·2	0·0	+ 0·1	+ 0·7	0·0	—	—	—
Salisbury	71·2	− 0·5	− 0·3	+ 0·1	+ 2·2	+ 0·3	− 3·3	—	—
Shaftesbury	60·0	0·0	0·0	0·0	0·0	—	—	—	—
Shrewsbury	62·3	+ 0·1	0·0	− 0·1	0·0	+ 2·8	—	—	—
Southampton	69·4	− 0·6	− 0·4	− 1·0	− 0·2	+ 0·3	—	—	—
Stokesay	64·8	− 0·3	− 0·4	− 0·4	− 0·3	− 0·2	—	—	—
Stonyhurst	58·5	− 0·1	0·0	− 0·1	+ 0·5	+ 0·5	—	—	—
Whitby	71·2	− 0·1	0·0	− 0·2	− 0·1	—	—	—	—
Whitchurch	53·0	− 0·3	0·0	− 0·6	+ 0·1	+ 2·2	—	—	—
Woolacombe	64·0	− 0·3	− 0·2	0·0	0·0	—	—	—	—
SCOTLAND.									
Balruddery	57·7	0·0	− 0·1	0·0	+ 0·3	—	—	—	—
Cally	57·9	0·0	+ 0·1	− 0·2	+ 0·5	—	—	—	—
Cargen	64·1	− 0·3	− 0·1	+ 0·1	+ 0·3	—	—	—	—
Crathes	54·2	+ 0·1	+ 0·1	0·0	+ 0·3	0·0	—	—	—
Deerness	55·2	+ 0·1	0·0	+ 0·8	+ 0·2	—	—	—	—
Dundee	60·4	+ 0·1	+ 0·1	− 1·3	+ 0·1	—	—	—	—
Dunrobin	59·8	0·0	0·0	0·0	—	—	—	—	—
Fort Augustus	58·1	− 0·1	− 0·1	0·0	+ 0·5	—	—	—	—
Fort William	58·8	− 0·1	− 0·1	—	+ 0·2	+ 0·3	—	—	—
Lairg	55·4	0·0	+ 0·1	− 0·1	+ 0·1	—	—	—	—
Laudale	55·6	0·0	+ 0·1	0·0	+ 0·1	—	—	—	—
Ochtertyre	55·3	+ 0·1	+ 0·2	0·0	+ 0·2	+ 0·1	—	—	—
Poltalloch	65·2	+ 0·1	0·0	− 0·2	+ 0·1	—	—	—	—
Rothesay	59·0	0·0	− 0·1	− 0·1	+ 0·1	—	—	—	—
Wolfelee	56·0	0·0	+ 0·2	− 0·2	+ 1·0	—	—	—	—
IRELAND.									
Armagh	56·2	− 0·4	− 0·5	− 0·1	+ 0·1	0·0	—	—	—
Ballinacurra	58·2	0·0	0·0	− 0·2	+ 0·2	—	—	—	—
Dublin, Phœnix Park ...	56·8	− 0·5	− 0·4	− 0·4	+ 0·3	+ 0·6	—	—	—
„ Trinity College	58·7	− 0·3	− 0·2	+ 0·1	+ 0·5	+ 0·7	− 0·1	0·0	—
Glasnevin	57·9	+ 0·3	0·0	− 0·1	+ 0·6	− 0·1	—	—	− 0·1

THERMOMETERS.

OTHER CLIMATOLOGICAL STATIONS.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Earth Thermometer.		Spare.
							1 ft.	4 ft.	
ENGLAND AND WALES.	°	°	°	°	°	°			°
Arlington Court	63·0	− 0·1	− 0·3	− 0·8	+ 0·2	—	—	—	—
Barnet	67·8	− 1·1	− 1·0	− 1·0	+ 1·5	− 0·2	—	—	—
Barnstaple	65·6	− 0·4	− 0·4	− 0·6	− 0·4	—	—	—	—
Bawtry	62·7	− 0·3	− 0·3	− 0·5	+ 0·4	—	—	—	—
Bristol, Overcourt Park...	63·0	—	—	− 0·1	0·0	+ 1·0	—	—	—
Buntingford	61·8	− 0·1	− 0·1	0·0	0·0	0·0	—	—	—
Colly Weston	65·0	− 0·1	+ 0·3	− 0·4	+ 0·1	—	—	—	—
Coventry	58·7	− 0·4	− 0·5	− 0·5	− 0·2	0·0	0·0	0·0	—
Felixstowe	65·5	0·0	+ 0·2	0·0	+ 0·5	—	—	—	—
Hawarden Bridge ...	61·2	—	—	+ 0·2	− 0·1	—	—	—	—
Hereford (Belmont) ...	60·0	− 0·1	− 0·3	− 0·2	+ 0·1	− 0·1	—	—	—
Leeds	65·0	− 0·1	− 0·1	− 0·4	0·0	—	—	—	—
Llangammarch Wells ...	67·4	− 0·3	− 0·6	− 0·4	+ 0·4	—	− 0·1	− 0·1	—
Maidenhead	70·8	− 0·2	− 0·7	− 0·4	+ 0·3	—	—	—	—
Newport	66·0	—	—	− 1·0	− 0·3	—	—	0·0	—
Newquay	66·0	− 0·2	− 0·2	0·0	− 0·3	—	—	—	—
Nottingham Castle ...	58·0	0·0	− 0·1	+ 0·2	0·0	+ 0·1	− 0·2	− 0·2	—
Portsmouth	62·4	0·0	0·0	− 0·1	− 0·4	0·0	0·0	+0·1	0·0
Preston	65·2	− 0·8	− 0·9	− 0·6	+ 0·4	—	− 0·2	− 0·2	—
Reading	66·0	− 0·5	− 0·5	− 0·2	+ 0·4	—	—	—	—
Rugby	57·8	− 0·2	− 0·2	− 0·2	− 0·1	—	—	—	—
Saltburn	—	—	—	—	—	—	—	—	—
Shoeburyness	67·7	0·0	0·0	− 0·4	—	—	—	—	—
Totland Bay	66·9	− 0·1	+ 0·2	− 0·1	0·0	+ 0·2	—	—	—
Truro	63·1	− 0·4	− 0·4	− 0·2	− 0·3	—	—	—	—
Ventnor	70·4	− 0·4	− 0·4	− 0·1	+ 1·2	—	—	—	—
Worthing	63·0	− 0·1	− 0·1	0·0	0·0	0·0	− 0·1	+ 0·2	—
SCOTLAND.—None.									
IRELAND.—None.									

1098. (i.) *Accounts.*—Submitted—The following Statement of Accounts for the three months ending 30th June, 1904 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1903-1904	—	1,489 12 7	ADMINISTRATION :		
Proportion of vote ...	—	3,500 0 0	Secretary	150 0 0	
Repayment of expenses charged under—			Salaries and wages ...	271 10 6	
(1.) Incidental expenses	4 13 9		Rent, fuel, and lighting	180 5 4	
(2.) Observatories ...	11 7 2		Incidental and contingent expenses ...	167 3 6	
		16 0 11	Furniture, fittings, &c.	5 7 3	
					774 6 7
SUPPLY OF INFORMATION :			SPECIAL RESEARCHES :		
			Salaries and other charges	—	223 9 8
			LAND METEOROLOGY :		
Weather Forecasts, Reports, &c. ...	167 2 11		Observatories and stations, including remuneration of observers	584 6 5	
Telegrams sent abroad	398 3 8		Salaries :— Discussion and reduction of observations, &c. ...	466 11 0	
		565 6 7			1,050 17 5
SUPPLY OF INSTRUMENTS, &c. :					
			WEATHER INFORMATION AND FORECASTS :		
Repayment of cost of M.O. instruments purchased by observers	42 8 0		Telegraphic reports and storm warnings, remuneration of observers, &c.	659 13 11	
Repayment of cost of other commissions...	63 14 3		Salaries:—Preparation and issue of reports and forecasts ...	364 8 9	
		106 2 3			1,024 2 8
CHARGES FOR COMMISSION :			INSPECTIONS :		
On supply of instruments, &c.	—	2 16 4	Salaries and travelling expenses	—	4 15 6
			OCEAN METEOROLOGY :		
SUPERANNUATION ACCOUNT :			Salaries : —Discussion and reduction of observations... ...	363 3 6	
Annuities	71 11 4		Expenses incidental to the supply of instruments :—		
Interest on Investment	7 18 2		Proportion of salaries for care and issue of instruments ...	42 10 0	
		79 9 6	Royal Navy ...	113 16 1	
			Mercantile Marine and stations ...	171 7 7	
					690 17 2
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	41 13 3
			SUPERANNUATION :		
			Pensions and allowances	207 8 2	
			Invested	750 0 0	
					957 8 2
			BALANCE :		
			Cash at Bank	944 10 2	
			„ at Office ...	47 7 7	
					991 17 9
		£5,759 8 2			£5,759 8 2

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors (partly estimated)	845 18 1	By cash at Bank and at Office ...	991 17 9
„ balance	662 0 10	„ H.M. Exchequer	325 0 0
		„ sundry debtors	191 1 2
	£1,507 18 11		£1,507 18 11

NOTE.—On June 30th the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £2,156 4*s.* 1*d.* The investment of £750 in May last is charged against this quarter

1098. (ii.) *Accounts.—Audit.*—Reported—That the cash accounts for the quarter ended the 30th June last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st April last, when there was a balance of £1,489 12*s.* 7*d.*, were £4,269 15*s.* 7*d.* against £4,190 11*s.* 4*d.* in the corresponding period of the preceding financial year. The payments were £4,767 10*s.* 5*d.* against £4,200 15*s.* 0*d.* during the same period in the previous year. The balance in hand and at the bank on the 30th June, 1904, amounted to £991 17*s.* 9*d.*, and at the same date in 1903 to £1,765 18*s.* 9*d.*

—— (iii.).—Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 18th October, 1904	4,840	3	9
Receipts from 19th October to 1st November, 1904 ...	59	0	0
	4,899	3	9
Cheques drawn from 19th October to 1st November, 1904	1,116	16	4
Cash balance on 1st November, 1904	3,782	7	5

—— (iv.) *Charges for Telegraphic Reporter at Roche's Point:—*

M.O. 2,472

General Post Office, London,
29th October, 1904.

SIR,

WITH reference to your letter of the 24th ultimo, No. M.O. 1,559, and previous correspondence, I am directed by the Postmaster-General to state that, in the circumstances explained by you, he has arranged with the telegraphist at Roche's Point for the transmission of meteorological reports to be continued under the existing allowances for the present.

I am to point out, however, that the morning report is usually handed in at Roche's Point shortly after 8 a.m. (English time), whereas the Telegraph Office is not opened for ordinary business until 8.25 a.m. (English time). The present arrangement thus necessitates a special attendance for the transmission of each morning report, and—as has already been explained to you—the Postmaster-General would not feel justified in compelling the telegraphist to accept, permanently, a smaller payment than that to which, under the regulations of this department, he is entitled, viz.: 1*s.* for each attendance outside the usual hours of business.

I am to suggest, therefore, for the consideration of the Meteorological Council, that it might possibly be found convenient to defer handing in the morning reports until 8.25 a.m. English time (8 a.m. Irish time) and thus obviate the necessity for special attendance.

I am, &c.,
A. F. KING.

The Secretary,
Meteorological Office.

1099. *Reports of Work* for October were submitted and approved.

1100. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 1st December*, 1904.

PRESENT :

PROFESSOR DARWIN (IN THE CHAIR),
MR. BUCHAN. | CAPTAIN FIELD, *Hydrographer.*
MR. SHAW, *Secretary.*

1101. The Minutes (1080–1100) of the last meeting (2nd November) were read and confirmed.

1102. The following Minutes of the Fourteenth Annual General Meeting of the Council were read and confirmed.

ANNUAL GENERAL MEETING.

THE Fourteenth Annual General Meeting of the Meteorological Council was held at 63, Victoria Street, on Wednesday, 16th November, 1904, at the hour of 2h. 30m. p.m.

The following Members were present :—

SIR R. STRACHEY, in the Chair.

PROF. DARWIN. | THE HYDROGRAPHER.
MR. DINES. | MR. SHAW (Secretary).

The Secretary read the notice convening the meeting as follows :—

Meteorological Office,
63, Victoria Street, London, S.W.,
November 3rd, 1904.

SIR,

I BEG to inform you that the Fourteenth Ordinary General Meeting of the Meteorological Council will be held on Wednesday, the 16th instant, at 2h. 30m. p.m., for the receipt of the Report of the Proceedings of the Council during the past year, the consideration of the Estimates for the year 1905–6, and the transaction of other ordinary business.

Draft copies of the Report of the Directors and of the Estimates proposed for the year 1905–6 are enclosed.

I am, &c.,
W. N. SHAW,
Secretary.

The report of the Directors was read as follows :—

The Directors report that in accordance with the articles of association :—

1. The Report of the Council for the year ended March 31st, 1904, which has been circulated to members of the Council, has been submitted to the Royal Society for presentation to Parliament.

2. The estimates for the year 1904–5, as adopted at the last ordinary general meeting, have been submitted to the Treasury and approved.

3. The accounts for the year ended March, 1904, after examination by two members of the Council, have been submitted to audit by the Exchequer and Audit Department.

4. That meetings of Directors have been held on the following days :—

1903	...	November	4	1904	...	February	24	1904	...	June	1
,,	...	,,	18	,,	...	March	9	,,	...	,,	15
,,	...	December	2	,,	...	,,	23	,,	...	July	1
,,	...	,,	16	,,	...	April	6	,,	...	October	5
1904	...	January	13	,,	...	,,	20	,,	...	,,	19
,,	...	,,	27	,,	...	May	4				
,,	...	February	10	,,	...	,,	18				

5. That the Minutes of the proceedings have been regularly recorded and printed.

The report was adopted.

Estimates.—Submitted the following memoranda :—

MATERIALS for preparing ESTIMATES for 1905–1906.

	Estimated Expenditure 1905–1906.		Voted for 1904–1905.
Administration :	£	£	£
(1.) Council, including portion of Secretary's salary	—	850	850
(2.) Secretary, less fees as member of Council	—	625	625
(3.) Salaries :			
Chief Clerk	333		
3 Junior Clerks	450		
Office Keeper	95		
2 Messengers	117		
Caretaker	95		
	1,090		
		1,090	1,085
(4.) Rent, fuel, and lighting :			
Rent	635		
Fuel	44		
Lighting	36		
		715	720
(5.) Incidental and contingent expenses :			
Office Keeper's contingent account	76		
Postage	128		
Carriage of parcels, &c.	16		
Books and Printing	30		
Sundries	50		
	300		
(5*a*.) Furniture and office repairs	100		
(5*b*.) Expenses incidental to International Meteorological Congress	25		
	425		
		425	395
Special Researches and Experiments :			
(1.) Salaries :			
Secretary's Special Assistant	300		
1 Junior Clerk	150		
	450		
(2.) Other charges :			
Anemometers at Holyhead	12		
Sundries	20 100 94		
	676	{ 580 94 }	780
Land Meteorology :			
(1.) Observatories and stations :			
Aberdeen allowance	295		
Armagh „	50		
Falmouth „	250		
Glasgow „	75		
National Physical Laboratory „	400		
Stonyhurst „	56		
Valencia	490		
Six Anemograph stations and St. Helena	86		
Meteorological Societies (Observations 2nd Order, Form A. (details) 7 stations. Form B. (results) 28 stations.	165		
Sundries (Forms, &c.)...	65		
	1,932		
		1,930	2,207
Carried forward	—	6,309	6,662

	Estimated Expenditure 1905–1906.		Voted for 1904–1905.
	£	£	£
Brought forward	—	6,309	6,662
(2.) Salaries: Discussion and reduction of observations:			
Observatories:			
1 Senior Clerk	300		
2 Junior Clerks	260		
2 Boy Clerks	85		
(*a.*)	645		
Stations of Second Order, Reports from Foreign Stations Library, and distribution of publications:			
1 Senior Clerk	275		
5 Junior Clerks and extra work	780		
1 Unclassified Clerk	58	1,990	1,955
3 Messengers	122		
2 Female Clerks	110		
(*b.*)	1,345		
Weather Information and Forecasts:			
(1.) Telegraphic reports and storm warnings:			
Telegrams from inland stations	492		
„ from abroad	114		
„ sent abroad	613		
„ Storm warnings	320		
„ Hay harvest forecasts	67		
Sundry telegrams, forecasts, &c.	84		
Private wires	50		
Postage of reports and forecasts	246		
Payments to reporters, &c. (allowances and expenses) ...	621		
Payments to Meteorological Societies for Weekly Reports	47		
Sundries	34		
	2,688	2,690	2,703
(2.) Salaries: Preparation and issue of reports and forecasts:			
2 Senior Clerks	542		
4 Junior Clerks	743		
1 Boy Clerk	58		
Addition for extra work	50		
	1,393	1,395	1,360
Inspections:			
Mr. Buchan, salary and travelling expenses	191		
Kew Inspectors, travelling expenses	73		
Other Inspections „	113		
Royal Meteorological Society, contribution towards cost of their inspections	25		
	402	400	400
Ocean Meteorology and supply of Instruments:			
(1.) Salaries: Discussion and reduction of observations:			
Marine Superintendent	400		
1 Senior Clerk	290		
5 Junior Clerks	790		
2 Boy Clerks	88		
3 Female Clerks	264		
	1,832		
Deduct proportion chargeable to care and issue of instruments	175		
	1,657	1,660	1,370
Carried forward		14,444	14,450

	Estimated Expenditure 1905–1906.		Voted for 1904–1905.
	£	£	£
Brought forward	—	14,444	14,450
(2.) *Care and issue of Instruments:*			
Proportion chargeable for Salaries: from (1)	—	175	170
Instruments, repairs, &c., for the Royal Navy	—	400	400
Instruments, repairs, &c., for the Mercantile Marine and Stations	379		
Agents: fees and incidental charges	100		
	479		
		475	290
Superannuation:			
Mr. Scott	400		
Capt. H. Toynbee	144		
Payments to R. Strachan and F. Gaster	300		
„ to Reserve*	750		
	1,594		
		1,594	1,594
Totals .. .. £	—	17,088	16,904
Appropriations in aid:			
Commission and repayment of incidental expenses	40		
Grazing, sale of Observatory forms, &c.	28		
Telegraph charges repaid, forecast fees, &c.	1,211		
Cost of instruments, repaid	159		
Annuity receipts and interest on investments not appropriated	350		
		1,788	1,604
		15,300	15,300

The estimated balance of account at 31st March, 1905, is £1,300.

* The amount of 2½ °/₀ Annuities held for the purchase of Superannuation Annuities, as occasion may arise, is £2,156 4*s.* 1*d.*

SYNOPSIS of OFFICE SALARIES.

Service.	Proposed for 1905–1906.	Voted for 1904–1905.	1905–1906.	
			Increase.	Decrease.
	£	£	£	£
Administration (not including Council)...	1,715	1,710	5	—
Special Researches	450	714	—	264
Land Meteorology	1,990	1,955	35	—
Weather Information	1,395	1,360	35	—
Ocean Meteorology	1,835	1,540	295	—
Totals	7,385	7,279	370	264

METEOROLOGICAL OFFICE. ESTIMATES for the Year 1905–1906.

Heads of Service.	Proposed for 1905–1906.		Voted for 1904–1905.		1905–1906.	
					Increase.	Decrease.
Administration:	£	£	£	£	£	£
Payment of Council	850	—	850	—	—	—
Secretary (less fees as member of Council)	625	—	625	—	—	—
Salaries and wages	1,090	—	1,085	—	—	—
Rent, fuel, and lighting	715	—	720	—	—	—
Incidental and contingent expenses ...	425	—	395	—	—	—
		3,705		3,675	30	—
Special Researches and Experiments:						
Salaries and other charges	—	674	—	780	—	106
Land Meteorology and supply of information:						
Observatories and stations	1,930	—	2,207	—	—	—
Salaries: Discussion and reduction of observations	1,990	3,920	1,955	—	—	—
				4,162	—	242
Weather Telegraphy and Forecasts:						
Telegraphic reports and storm warnings ...	2,690	—	2,703	—	—	—
Salaries: Preparation and issue of reports and forecasts	1,395	4,085	1,360	4,063	22	—
Inspections:						
Salaries and travelling expenses	—	400	—	400	—	—
Ocean Meteorology:						
Salaries: Discussion and reduction of observations	1,660	—	1,370	—	—	—
Expenses incidental to the supply of instruments	1,050	2,710	860	2,230	480	—
						—
Superannuation	—	1,594	—	1,594	—	—
Totals	—	17,088		16,904	532	348
Deduct—Appropriations in aid:						
Commission and repayment of incidental expenses	40					
Grazing rent and sale of Observatory forms	28					
Telegraph charges repaid and forecast and information fees	1,211					
Cost of instruments repaid	159					
Annuity receipts and interest on Investments not appropriated	350					
		1,788				
Net estimated charge		15,300				

Note.—The total estimated amount under each head has been shown, and the appropriations in aid have been collected into a single total.

The estimates were approved, and the Secretary was instructed to forward a copy to the Treasury and the Royal Society (P.C. 3313 and 3314).

The meeting then adjourned.

1103. *Antarctic Expeditions* (Minute 1070).—The Secretary reported that at a second meeting of the Committee appointed by the Royal Society (Minute 1045) to co-operate with the Council, held at the office on Wednesday, 16th November, 1904, at which were present Mr. W. H. Dines, Mr. H. T. Ferrar, Dr. H. R. Mill, Lieut. C. Royds, Mr. C. T. R. Wilson, and the Secretary :—

i. Additions to the data available were reported as follows :—

2 M.S. vols. of observations of atmospheric electricity by Mr. Bernacchi.

2 M.S. vols. of observations of aurora polaris by Mr. Bernacchi.

Measurements of carbonic acid, sea water analyses and temperatures, ice measurements, ozone measurements, measurements of evaporation of ice (M.O. 2,737) and measurements of sea waves by Mr. Ferrar and Lieut. Royds.

ii. The letter from Professor von Drygalski (M.O. 2,400) was read and the scheme of tabulation for the "Discovery" observations, which had been circulated to members of the Committee, was revised.

iii. The following revised list of proposed memoirs was drawn up and a distribution of the work of preparing the memoirs in co-operation with the Meteorological Office, as indicated by the names appended to the titles, was suggested.

1. Instruments—General Notes. (Mr. Royds.)

2. Spirit minimum and mercury minimum readings. (Dr. Chree.)

3. (*a*) Open air temperature and screen temperature (Terrestrial radiation).

(*b*) Aspiration psychrometer readings, wet and dry bulb readings, observations on evaporation and precipitation, observations upon the evaporation of ice. (Mr. Dines.)

4. Sequence of weather changes ; automatic records. (Meteorological Office.)

5. Wind measurements. (Meteorological Office.)

6. The climatology of Victoria Land for the two years, based on observations at winter quarters and on sledge journeys, together with observations of the "Morning" and "Terra Nova," with appendix on cloud observations. (Meteorological Office.)

Appendix on ice temperatures at fixed depths. (Mr. Ferrar.)

7. Observations of atmospheric electricity and aurora polaris. (Mr. C. T. R. Wilson.)

8. Observations of ozone in the atmosphere. (Mr. C. T. R. Wilson.)

9. Observations of carbonic acid in the atmosphere. (Mr. Ferrar and Dr. Letts.)

10. Sea water analyses and temperatures. (Mr. Ferrar in correspondence with Mr. H. N. Dickson and Mr. Buchanan.)

11. Thickness, salinity, and temperature of sea-ice. (Mr. Ferrar.)

12. Wave observations. (Mr. Ferrar in correspondence with Commander Wilson Barker.)

13. The general meteorology of the Antarctic embodying the results of the auxiliary marine and land observations at Greenwich noon. (Meteorological Office.)

Reported also that the following temporary engagements had been made for the reduction of the Antarctic meteorological observations :—

Lieut. O. Jones, R.N.R., from 16th November, at £3 weekly.

A. C. Gibbon, Boy Clerk, from 25th November, at 15*s.* weekly.

J. W. Shepherd, Boy Clerk, from 25th November, at 15*s.* weekly.

J. G. Rees, from 30th November, at 18*s.* 6*d.* weekly.

Approved.

The Secretary was requested to report to the next meeting on the further provision of the necessary clerical staff and on the distribution of the work involved in the preparation of the memoirs proposed to be assigned to the Meteorological Office.

Attention was called to the fact that the subjects of some of the memoirs proposed by the Committee were not strictly speaking meteorological, and were not provided for in the estimate of £500 reported to the Royal Society. The Secretary was requested to bring the matter to the notice of the Royal Society.

The Secretary was further requested to inform the Royal Society that in preparing the estimates for 1905–6 the Council had notified H.M. Stationery Office that special application would be made for the printing of the meteorological report of the expedition (Minute 1086), and to ask the President and Council for a communication on the subject to be forwarded to the Controller.

1104. *Station in St. James's Park* (Minute 1084).—The Secretary reported that the equipment of this station was completed on 8th November, and that observations were commenced on the evening of the same day. These are now taken regularly at 8 a.m. and 6 p.m. each day, including Sunday, and copies of the morning and evening weather charts and forecasts are exhibited on the boards provided for that purpose together with the automatic records of rainfall, sunshine, and temperature.

The following arrangements have been made for the carrying on of the work :—

The 8 a.m. and 6 p.m. observations are made by the staff of the Forecasting Branch, an allowance of 3*s.* 6*d.* per week being made for this special service.

The information displayed on the notice boards is changed regularly each day at about 10.30 a.m. and 9.30 p.m. by two of the office messengers, the additional allowance for these duties being at the rate of 1*s.* 6*d.* per week.

Approved.

1105. *Ben Nevis Observatories.*—Reported—the receipt of a memorandum from the Directors with reference to the closing of the Observatories from 1st October last.

1106. *Instruments—Admiralty Quarterly Return :—*

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 31st SEPTEMBER, 1904.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st July, 1904	74	79	10	63	48	37
	Received, new	—	42	120	—	24	15
	„ cleaned and repaired.	35	58	—	—	—	—
	Total	109	179	130	63	72	52
	Issued	18	69	43	9	8	6
	Total available 1st Oct., 1904.	91	110	87	54	64	46

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.
†Portsmouth	25	21	—	4	55	43	—	12	150	104	—	46	50	51	1	—	50	64	14	—	25	13	—	12
Devonport	25	22	—	3	55	50	—	5	150	132	—	18	50	47	—	3	50	44	—	6	22	19	—	3
†Chatham	25	20	—	5	55	45	—	10	150	162	12	—	50	47	—	3	50	45	—	5	25	25	—	—
Sheerness	6	0	—	6	15	8	—	7	30	23	—	7	10	9	—	1	10	10	—	—	10	9	—	1
Queenstown	5	4	—	1	10	7	—	3	15	15	—	—	8	5	—	3	8	7	—	1	—	—	—	—
(Dockyards, Home) Totals	86	67	—	19	190	153	—	37	495	436	12	71	168	159	1	10	168	170	14	12	82	66	—	16
Gibraltar	2	2	—	—	2	7	5	—	4	4	—	—	3	2	—	1	3	3	—	—	—	—	—	—
†Malta	11	10	—	1	15	10	—	5	60	50	—	10	10	8	—	2	10	10	—	—	1	1	—	—
Bombay	4	1	—	3	3	1	—	2	10	4	—	6	4	2	—	2	4	2	—	2	1	2	1	—
Halifax	3	1	—	2	4	3	—	1	20	16	—	4	4	4	—	—	4	2	—	2	1	—	—	1
Bermuda	3	1	—	2	4	3	—	1	20	20	—	—	4	4	—	—	4	4	—	—	1	2	1	—
Jamaica	3	1	—	2	2	4	2	—	10	9	—	1	2	2	—	—	2	2	—	—	1	1	—	—
Cape of Good Hope	7	6	—	1	8	8	—	—	33	31	—	2	8	10	2	—	8	8	—	—	2	2	—	—
Trincomali	3	1	—	2	3	2	—	1	10	6	—	4	4	5	1	—	4	3	—	1	1	1	—	—
Hong Kong	17	11	—	6	21	22	1	—	87	44	—	43	21	15	—	6	21	14	—	7	5	11	6	—
Sydney	5	3	—	2	6	2	—	4	25	7	—	18	6	9	3	—	6	11	5	—	1	1	—	—
†Esquimalt	4	0	—	4	5	9	4	—	15	22	7	—	2	2	—	—	2	3	1	—	1	2	1	—
(Dockyards, Abroad) Totals	62	37	—	25	73	71	12	14	294	213	7	88	68	63	6	11	68	62	6	12	15	25	9	1
Grand Totals and Net Shortage at Depôts	148	104	—	44	263	224	—	39	789	649	—	140	236	222	—	14	236	232	—	4	97	91	—	8
At Meteorological Office ...	45	91	46	—	120	110	—	10	250	87	—	163	80	54	—	26	80	64	—	16	50	46	—	4
Repairing	—	—	26	—	—	—	13	—	—	—	—	—	—	—	30	—	—	—	30	—	—	—	12	—
Returnable from Depôts ...	—	—	25	—	—	—	29	—	—	—	11	—	—	—	3	—	—	—	5	—	—	—	1	—
Ordered	—	—	—	—	—	—	—	—	—	—	132	—	—	—	20	—	—	—	—	—	—	—	10	—
Net Surplus or Shortage at M.O.	—	—	+97	—	—	—	+32	—	—	—	—	−20	—	—	+27	—	—	—	+19	—	—	—	+19	—
Proposed to be Ordered ...	—	—	—	—	—	—	—	—	—	—	(210)	—	—	—	—	—	—	—	—	—	—	—	—	—

† Supplies have been sent since 30th September, 1904.

NOTE.—No change has occurred in the Stock of Hydrometers.

Approved.

R. F. WALLACE.

1107. *Publications* (i) O. 59 (Minute 1086, iii).—The Secretary reported that after inquiry he had ordered a fresh impression of the temperature charts of the Indian Ocean which were of the wrong size, and had given directions for the rejected copies to be put in covers for presentation in connexion with the collection of marine observations.

Approved.

The Secretary reported that he proposed to print "Notes on Instruments," as an occasional supplement to the Monthly Report, Notes by Dr. Chree, upon Solar maximum thermometers and other instruments, and an account of the comparison of the electrical earth thermometers, with the earth thermometers of the Symons pattern, at the Radcliffe Observatory, Oxford, by Dr. Rambaut.

Approved.

1108. *Publications—Presentation Copies—Malta.*—The presentation of a copy of the Weekly Weather Report to the Observatory of Malta at the request of the Lieutenant-Governor (M.O. 2653) was authorised.

1109. *Mercantile Marine—Testing of Instruments* (Minute 1047).—The Secretary reported that he had seen Mr. Howell, Assistant Secretary of the Board of Trade, and had learned that the Board would be glad to co-operate with the Office in any way they could to secure the regular testing of instruments at British ports, and would like the alternatives proposed by the Council put forward for consideration.

It was agreed that a formal letter on the subject be addressed to the Board of Trade.

1110. *Mercantile Marine—Instruments* (Minute 1073).—Authority was given for ordering 180 ordinary thermometers, 100 hydrometers, and 20 screens.

1111. *Colonial and Foreign Stations—Ocean Island* (Minute 878, 930).—Submitted —Observations received from Ocean Island (M.O. document 11744).

The Secretary was directed to invite the observer to send a more complete return.

1112. *Oceanographical Investigation in the Indian Ocean.*—Read—M.O. 2,679 from Mr. J. Stanley Gardiner, of Gonville and Caius College, Cambridge, asking for the co-operation of the Council in obtaining samples of water from vessels crossing the Indian Ocean during the cruise of oceanographical investigation of H.M.S. "Sealark," for six months from March next.

The Secretary was directed to reply that the Council would gladly co-operate in the manner desired if Mr. Gardiner would in return supply the Council with observations of the upper air by means of kites during the cruise, and he was authorised to supply the necessary apparatus.

1113. *Marine Biological Association.*—Read—M.O. 2,709 from Dr. E. J. Allen asking for the support of the Council in an application to the Board of Agriculture and Fisheries for the continuation of the oceanographical work in the English Channel.

The Secretary was directed to write to Dr. Allen upon the matter.

1114. *Storm Signal Stations.*—Read the following letter :—

M.O. 2,661.

Lloyd's,
22nd November, 1904.

SIR,

I HAVE the honour to beg that you would be so good as to inform your Council that arrangements have recently been concluded by Lloyd's whereby commercial maritime signalling is now conducted on behalf of Lloyd's by the Coast guard at the Naval Signal Station at the Needles (I.W.).

It has been suggested that it might possibly be convenient if arrangements could be made for the exhibition of storm-warning signals at this station, and I should be very much obliged to you if you would be so good as to allow me to be informed whether, in the opinion of your Council, it would be worth while to have these storm-warning signals exhibited at the Needles.

I am, &c.,
H. M. HOZIER,
Secretary.

The Secretary,
Meteorological Office.

The Secretary was directed to reply that in view of the proximity of existing stations the Council did not consider a station at the Needles necessary.

1115. *Fishery Barometer Stations.*—Read—M.O. 2,636 from Mr. John McLoone, Postmaster, Rosbeg, Co. Donegal, asking for a Fishery Barometer, and a letter from the Irish Board of Agriculture (M.O. 2,609) upon the subject.

The Secretary was directed to make further inquiries from the Board.

1116. *Sea Temperature Observations.*—Read—the following memorandum from the Marine Superintendent:—

Observations of sea surface temperature are required from the following lighthouse and light-vessels.

Lighthouse—
Fastnet.

Light-vessels—
Daunt Rock.
Barrels.
Blackwater Bank.
Arklow Bank { South. / North.
Kish.
Skulmartin Reef.
Morecambe Bay.

The Secretary was directed to apply to the several Lighthouse Authorities for the observations.

1117. *Anemograph Stations—Alnwick* (Minute 940).—Reported—that the Anemograms received from Alnwick showed that the instrument had been restored to working order from March of this year.

1118. *Telegraphic Reporting Stations.*—Read—M.O. 2,708 from Mr. J. M. Le Sage, of the *Daily Telegraph*, asking for daily observations at a late hour from Stornoway similar to those supplied from Valencia.

The Secretary was directed to supply the information if he was able to make a satisfactory arrangement with the observer at Stornoway and with the *Daily Telegraph.*

1119. *Inspection Reports* (Minute 1097).—The Secretary was authorised to consult the Board of Agriculture and Fisheries as to the most suitable means for keeping up the efficiency of the Fishery Barometer stations.

1120. *Hildebrandsson's Cloud Report* (Minute 1027).—The Secretary reported that the translation of Hildebrandsson's report had been included, by the Royal Meteorological Society, in the Quarterly Journal for September; that he had found it desirable to order 1,000 copies of the plates, and submitted an account from Mr. Lars Ljunggren, of Stockholm, which had been certified by Professor Hildebrandsson for 513 Kroners. Carriage, &c. 13*s.* 10*d.*

Approved.

1121. *International Cloud Atlas.*—It was agreed to subscribe for 100 copies, at 8 francs, of the new edition of the International Cloud Atlas, in course of preparation by Messrs. Hildebrandsson, Riggenbach, and Teisserenc de Bort. (M.O. 973.)

1122. *Logs.*—Fifteen received, none excellent; also three short logs.

1123. *Storm Warnings:*—

Signals hoisted on 11 days; total number of districts warned 55.
In 28 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 17 districts by subsequent strong winds (force 7 or 6).
In 10 districts they were not required.

Gales experienced for which no Warnings were issued.—None.

1124. *Forecasts.*—Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of October, 1904 :—

The letters used have the following signification :—
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	36	61	49	89
,,	b	48	32	40	
,,	c	10	7	8	
,,	d	6	0	3	
Scotland, E.	a	49	58	54	81
,,	b	32	23	27	
,,	c	19	13	16	
,,	d	0	6	3	
England, N.E.	a	55	55	55	89
,,	b	29	39	34	
,,	c	16	6	11	
,,	d	0	0	0	
England, E.	a	52	71	62	87
,,	b	32	19	25	
,,	c	16	10	13	
,,	d	0	0	0	
Midland Counties	a	48	74	61	84
,,	b	29	16	23	
,,	c	23	10	16	
,,	d	0	0	0	
England, S.	a	65	65	65	94
,,	b	29	29	29	
,,	c	3	6	5	
,,	d	3	0	1	
Scotland, W.	a	32	78	55	87
,,	b	45	19	32	
,,	c	16	3	10	
,,	d	7	0	3	
England, N.W.	a	39	61	50	78
,,	b	29	26	28	
,,	c	23	13	18	
,,	d	9	0	4	
England, S.W.	a	45	65	55	83
,,	b	26	29	28	
,,	c	19	6	12	
,,	d	10	0	5	
Ireland, N.	a	26	65	46	81
,,	b	42	29	35	
,,	c	26	6	16	
,,	d	6	0	3	
Ireland, S.	a	23	55	39	77
,,	b	36	39	38	
,,	c	35	3	19	
,,	d	6	3	4	
Summary.					
British Islands	a	43	64	54	85
,,	b	34	27	31	
,,	c	19	8	13	
,,	d	4	1	2	

1125. *Accounts.*—Submitted—The following statement:—

	£	s.	d.
Cash balance on 1st November, 1904	3,782	7	5
Receipts from 2nd to 30th November, 1904 ...	57	7	4
	3,839	14	9
Cheques drawn from 2nd to 30th November, 1904	1,261	9	7
Cash balance on 30th November, 1904	£2,578	5	2

1126. *Reports of Work* for November were submitted and approved.

1127. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W.*, 14*th December*, 1904.

PRESENT:

CAPTAIN FIELD, *Hydrographer.* | MR. SHAW, *Secretary.*

In the absence of a quorum of Directors the following items (Minutes 1128 to 1144) were provisionally dealt with.

1128. The Minutes (1101–1127) of the meeting of 1st December were read.

1129. *Telegraphic Reports, Iceland* (Minute 1053).—Read—The following reply from the Postmaster-General:—

M.O. 2,760.

General Post Office, London,
5th December, 1904.

SIR,

I AM directed by the Postmaster-General to acknowledge the receipt of your letter of the 25th ultimo, in which you ask that steps may be taken, in connection with the grant of landing rights in this country for the proposed cable to the Faroe Islands and Iceland, to secure the transmission of daily meteorological reports from those Islands upon favourable terms.

In reply I am to say that the point had already occurred to the Postmaster-General, and that he will bear it in mind in connection with the negotiations with the Company as to the conditions under which landing rights will be granted.

I am to add that the landing rights in question will be given by the Board of Trade and not by this Department; but as the Postmaster-General is already in communication with the Board it will not perhaps be necessary for the Meteorological Office to communicate with them in the matter.

I am, &c.,
J. C. LAMB.

The Secretary,
Meteorological Office.

It was agreed to thank the Postmaster-General and say that the Council would leave the matter in his hands.

1130. *Daily Weather Report, Official Copies* (Minute 1051).—Read—The following letter from the Admiralty :—

M.O. 2,724.

Admiralty,
2nd December, 1904.

SIR,

MY Lords Commissioners of the Admiralty are informed that the Meteorological Council, having recently received a request from the Coast Guard Officer at Aberdeen that he might be regularly furnished with the daily weather forecast, have expressed their readiness to furnish daily to the Admiralty a certain number of meteorological forecasts addressed and ready for transmission under the Admiralty frank to the Officers of Coast Guard at places where the forecasts would prove useful.

I am commanded by their Lordships to express their thanks for the offer the Council have been good enough to make, and to suggest that the forecasts may be addressed to the various officers of Coast Guard named on the attached list and sent to the office of the Admiral Commanding Coast Guard and Reserves at 66, Victoria Street, S.W.

I am, &c.,
EVAN MACGREGOR.

The Secretary,
Meteorological Office.

List of Coast Guard Officers at Stations where it is considered weather forecasts would be of value :—

ENGLAND.

EASTERN DISTRICT :—

The Chief Officer, Coast Guard Station, Blyth.
The Chief Officer, Coast Guard Station, Tynemouth.
The Divisional Officer, H.M. Coast Guard, Sunderland.
The Chief Boatman in Charge, Coast Guard Station, Seaham Harbour.
The Chief Officer, Coast Guard Station, Hartlepool.
The Divisional Officer, H.M. Coast Guard, Hull.
The Chief Officer, R.N.R. Battery, Cleethorpes.
The Chief Officer, Coast Guard Station, Felixstowe.

SOUTHERN DISTRICT :—

The Divisional Officer, H.M. Coast Guard, Sandgate.
" " Bognor.
" " Weymouth.
" " Lyme Regis.
" " Paignton, Devon.
" " Salcombe, R.S.O., S. Devon.

WESTERN DISTRICT :—

The Divisional Officer, H.M. Coast Guard, Stonehouse, Plymouth.
" " Fowey.
" " Penzance.
" " Mumbles, Swansea.
" " Tenby, S. Wales.
" " New Brighton, Birkenhead.
" " Peel, Isle of Man.

SCOTLAND.

The Divisional Officer, H.M. Coast Guard, Aberdeen (supplied).
" " Greenock.
" " Lerwick.
" " Inverness.
The Chief Officer, Coast Guard Station, Kirkwall, Orkney Islands.
The Chief Officer, R.N.R. Battery, Wick.
The Chief Boatman in Charge, Coast Guard Station, St. Andrews, N.B.
The Chief Officer, Coast Guard Station, Crail, N.B.
The Chief Boatman in Charge, Coast Guard Station, Dunbar.
The Chief Officer, Coast Guard Station, Dysart (for Leven Detachment).
The Chief Boatman in Charge, Coast Guard Station, North Berwick.
" " " Redheugh, N.B.

IRELAND.

NORTHERN DISTRICT :—

The Chief Officer, Coast Guard Station, N. Island of Arran, Co. Galway.
The Chief Boatman in Charge, Coast Guard Station, Ross, Co. Mayo.
The Divisional Officer, H.M. Coast Guard, Moville, Co. Donegal.
" " Wicklow.

SOUTHERN DISTRICT:—

The Divisional Officer, H.M. Coast Guard, Tramore, Co. Waterford.
" " Castletownsend, Skibbereen, Cork.
" " Castletown Bere, Bantry.
" " Dingle, Co. Kerry.
" " Ballyheigue, Co. Kerry.
" " Spanish Point, Miltown Malbay, Co. Clare.

It was agreed that copies of the Daily Report ready for posting be handed in at 66, Victoria Street, as desired by the Admiralty, and that the number of copies printed be increased if necessary to meet the additional requirements.

1131. *Antarctic Expeditions*—(Minutes 1070, 1103).—The Secretary submitted a scheme of payment for the preparation of those of the memoirs enumerated in Minute 1103 which were provided for in the estimate of £500. He suggested that the drafting of those memoirs assigned to members of the Office Staff should be done outside office hours, and that the payment should be an additional payment in each case.

He further reported that he had consulted the Secretaries of the Royal Society respecting payments for work which was not provided for in the estimate of £500 (*see* Mr. Ferrar's letters, M.O. 2642, 2737), and that he had been asked to refer the matter to the Royal Geographical Society. He accordingly suggested that a similar scale of payment should be put forward for the memoirs which are not provided for in the estimate mentioned, and that the question of providing for the payments should be referred to the Royal Geographical Society. (*See* P.C. 542.)

Approved.

Read—M.O. 2738, from Mr. H. N. Dickson, asking for instructions as to the samples of water which required to be analysed in connexion with the work on "Sea Water Analysis and Temperatures," at a cost of about sixpence a sample.

He suggested that as Mr. Dickson was a member of the Royal Society Committee, the Committee would probably take his advice on the subject and that the question of the costs was on the same footing as the other costs of the work which was not intended to be provided for in the Estimate, and that he should inform Mr. Dickson to that effect.

Approved.

Reported—The appointment of Miss I. Margesson as typewriter and shorthand writer at a salary of £2 per week from 18th December for a period of six months, subject to one month's notice on either side. (P.C. 3583.)

Approved.

1132. *Fishery Barometers, Ireland* (Minutes 1072, 1092, 1115).—Read—The following letter:—

M.O. 2,730.
No. 3423/04 F.B.

Department of Agriculture and Technical Instruction for Ireland,
Upper Merrion Street, Dublin,
2nd December, 1904.

SIR,

WITH reference to your letter of the 10th ultimo (M.O. 2,355) I have to state, for the information of the Meteorological Council, that Kilkee is of very slight importance as a fishing station, the only craft thereat being a few canvas canoes that seldom venture more than a mile from the shore. The Coastguard at Kilkee could, no doubt, look after a barograph; but an ordinary aneroid would seem to be sufficient for the requirements of the place.

At Kilmackillogue there is a number of small rowing boats and one sailing trawler. These shelter in various creeks some miles apart from each other, and there is apparently no centre in the locality at which a barograph would be of real utility. Furthermore, there is no Coastguard stationed at Kilmackillogue who could look after the instrument if it were provided.

Having regard to the facilities that exist on the East Coast for distributing weather forecasts as compared with those on the West Coast (from which disturbances mostly come), the Department are advised that a general system of supplying such information to fishermen in Ireland could be usefully started at—

Portavogie, County Down,
Howth, County Dublin,
Arklow, County Wicklow, and
Kinsale, County Cork,

all of which are important fishing ports.

Extensions of the system could take place from time to time.

If a personal discussion of the matter be considered advisable the Department can arrange for the attendance of their Chief Inspector of Fisheries at your Office on some convenient date.

I am, &c.,
T. P. GILL,
Secretary.

The Secretary,
Meteorological Office.

The Secretary was requested to ask for an interview with the Board's Chief Inspector of Fisheries.

1133. *Station in St. James's Park* (Minutes 1084, 1104).—The Secretary reported that in connexion with preparation of the additional charts, &c., it was desirable that the Assistants in the Forecast Branch should attend on Saturdays, and recommended that the arrangement made under Minute 692 (iv.) be discontinued, and the ordinary Saturday attendance resumed ; further, that payment be made at the rate of 6 per cent. on the monthly salary for the Sunday evening attendance hitherto accepted in lieu of Saturday attendance.

Approved.

1134. *Climatological information for the Admiralty.*—Read—M.O. 2723, from the Hydrographer, asking for climatological information for certain stations, for a new edition of the Gulf of St. Lawrence Sailing Directions.

Approved.

1135. *Storm Signal Stations, Hamble.*—Reported—The discontinuance of the transmission of storm signals to Mr. W. H. Stevens, of Ravenswood, Hamble, the telegram on 7th December being undelivered on account of the addressee having gone away. (M.O. 2778 and M.O. 589, '94.)

1136. *Telegraphic Reporting Stations, Wick.*—Read—M.O. 2798 from Mr. J. G. Sinclair, reporting the death of his father, Mr. James Sinclair, who had reported for upwards of 30 years, and asking that Miss Jessie Sinclair, who had acted as observer during the period of her father's failing health, should be reporter in his place.

The question was postponed pending inquiries as to whether general arrangements could be made for the Coastguard to undertake the duty of reporting the weather from the British Coasts. The Hydrographer undertook to make preliminary inquiries of the Admiral-Superintendent of Naval Reserves.

1137. *Publications—Presentation Copies.*—Agreed to present a copy of the Second Order Stations volume to the Meteorological Office of Warsaw, in return for their volume of corresponding observations. (M.O. 2589.)

1138. —— Agreed that the stock of Synoptic Charts of the Indian Ocean for January and February, 1861, might be reduced to 20 of each month, the remainder being used for presentation to the Marine observers.

1139. *Logs.*—Five registers and logs received. One abbreviated register.

1140. *Storm Warnings :—*

Signals hoisted on 5 days ; total number of districts warned, 45.

In 25 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 13 districts by subsequent strong winds (force 7 or 6). In 7 districts they were not required.

Gales experienced for which no warnings were issued.—None.

1141. *Accounts—Telegraphic Stations* (Minute 818, iii).—It was resolved that the usual bonus of £3 3*s.* be given to those of the Telegraphic observers who have discharged their duties faithfully during the year (Minutes, 1878, p. 22).

1142. —— An additional payment of £15 to Petty Cash Account was approved.

1143. *Accounts.*—Submitted—The following statement:—

	£	s.	d.
Cash balance on 30th November, 1904	2,578	5	2
Receipts from 1st to 13th December...	19	9	1
	2,597	14	3
Cheques drawn from 1st to 13th December ...	128	6	7
Cash balance on 13th December, 1904	£2,469	7	8

1144. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 11th January*, 1905.

PRESENT:

SIR R. STRACHEY (IN THE CHAIR).

Captain FIELD, *Hydrographer.* | MR. SHAW (*Secretary*).

1145. The Minutes (1101–1144) of the two preceding meetings, 1st December and 14th December, were read and confirmed.

1146. *Antarctic Expeditions* (Minutes 1070, 1103).—Read—The following letter:—

[*Translation.*]

GERMAN ANTARCTIC EXPEDITION.—F. No. 604.

Berlin, N.W. 6,
den Schiffbauerdamm 27,
15th December, 1904.

DEAR SIR,

I AM much obliged to you for kindly sending the report you delivered to the Committee of the Royal Society on the projected meteorological work there. I have studied it with great interest and beg leave to make the following observations:—

I gather with much satisfaction, from your letter of the 19th November, that you are ready to exchange with us the material from observations acquired through the international meteorological co-operation. In this way it will be possible for each of us to continue the work which lies specially within his province, with the help of all existing material.

It may be useful that our work should overlap, in spite of the double expenditure of work and time involved in this dual treatment of a common subject, since light may be thrown upon particular parts from different points of view.

At first I considered the advisability of the meteorological work being treated from the English side as regards the Pacific half of the southern hemisphere, and from the German side in reference to the Indian-Atlantic half. But when I learned of the plan which you had formed for the treatment of the whole region, and having regard to the difficulties engendered by the use of different units of measure for atmospheric pressure and temperature employed by both sides, I gave up the idea.

The mutual exchange of observations will, in my opinion, proceed along the simplest and most practicable lines if the records of the observations are given in tabular form. This form allows the work to be most easily adapted to any special plan.

I should be much obliged if you will tell me whether you agree with this proposal, and when you could commence forwarding the observations. It will probably be to our mutual advantage if this exchange of observations could be commenced at an early date.

The material which we could place at your disposal has been already fully described in my letter of the 21st October, but, in the meantime, it has been supplemented by manuscript tables of observations at fixed hours from the Argentine stations of the higher order between 1st October, 1901, and 1st April, 1903.

We also intend here to amplify, as far as possible, the international simultaneous maritime observations by the usual (six times daily) meteorological observations aboard ship. The necessary tabulated extracts will be drawn up, as soon as possible, by the German observatory at Hamburg from the German ship logs received there.

As you also have arranged to draw on the usual logs for the completion of the material, it seems advisable to come to an understanding as to how the records according to *local time* contained therein, can be made to correspond with the *Greenwich noon* observations used in accordance with the international co-operation agreement. It is our intention here to extract from the meteorological logs the observations for the two observation hours one on each side of Greenwich noon. One will be able easily to obtain by interpolation the values corresponding to Greenwich noon.

I hope to hear that you are also inclined to follow this course; but if not what other would you prefer?

In order to avoid a double exchange of observations, I have had prepared an alphabetical list of those ships whose logs have been received here, partly in the original and partly copied (*see* enclosure) (not printed here). The greater number of these detailed logs have been sent over to us from the Hydrographic Office in Washington. As you probably have also received meteorological data from Washington, a mutual comparison of their information would be desirable, and then the exchange would naturally be confined to those tables which had not been transmitted to both sides.

Be good enough to inform us of which ship's logs you have no copy and which you can place at our disposal.

The scheme you have communicated to us for the publication of the meteorological observations of the "Discovery's" Station is similar to that for the publication of the "Challenger's" observations, and does not resemble those models which have been followed in the publication of the results of Stations of the First Order, since they were recommended by the International Meteorological Congress at Vienna in 1873, and, later, in the conference of the Meteorological Committee.

The observatories at Potsdam and Pawlowsk, for example, follow these models. I think they are preferable in so far as they give a convenient survey of the periodical and non-periodical changes of each individual element, extending over a longer space of time. Moreover, it is sufficient, in order to obtain a survey of the general state of the weather and to compare the simultaneous values of the different elements, to give, besides the forms with the tabulated hourly values of each element, the tables which have been adopted by international agreement for the monthly records, in full, of Stations of the Second Order. We obtain, in the smallest possible space, a sufficient impression of the state of the weather for each single day, and can easily follow the progress of the weather during a lengthened period.

We proposed adopting the "Challenger" method of treating the work in such cases only where the ship continually changed its position, because, with a changing locality, the necessity of comparing the values of specified meteorological elements in the different months and seasons is not so urgent; whereas the survey of the whole phenomena each day is of great interest.

At the fixed Stations, on the other hand, we wished to bring into greater prominence the individual elements in their daily and yearly course, and this is guaranteed by the scheme mentioned above.

I could not omit to mention this to you in case you wished to weigh the advantages of the comparison I speak of, and to suggest any corresponding alteration in the form of publication proposed.

I shall be very glad to receive your kind communication on the subject.

I am, &c.,

(Signed) W. DRYGALSKI,

Leader of the German Antarctic Expedition.

W. N. Shaw, Esq.,
Secretary of the Meteorological Council,
63, Victoria Street,
London, S.W.

And the following memorandum :—

MEMORANDUM.

TABULATING and CHARTING METEOROLOGICAL OBSERVATIONS in connexion with the INTERNATIONAL ANTARCTIC EXPEDITION.

This work was commenced on the 5th December, 1904. Up to the present time five months' observations have been extracted, corrected, and tabulated; two months' observations have been entered on the sheets, and one month's observations charted. The charts for this month (October, 1901) are still incomplete, however, observations from the Scottish Antarctic Expedition, from Germany, Sweden, and from many land stations not having yet come to hand.

In reference to Professor von Drygalski's letter of the 15th ultimo I beg to offer the following remarks :—

In regard to paragraph 1, on page 2, Meteorological Office observations, in tabular form, will be in a condition to be dealt with directly in any way Germany may desire to deal with them ; barometer observations will be corrected for height and temperature ; wind observations will be given true.

Referring to paragraph 2 on the same page, our form is so simple that Germany may like to adopt it ; the interchange of observations may commence whenever the Council wishes. The letter referred to by Professor Drygalski—M.O. 2400, October, 1904—says, it will be remembered, that Germany has logs from ships habitually reporting to the Deutsche Seewarte ; about 450 logs from the United States Hydrographic Office ; observations from French colonies in West Africa ; from Rio de Janeiro, and from the Philippines. Germany expects, in addition, reports from Holland, France, Austria, Sweden, Norway, and Russia, as the co-operation of these countries was asked for and promised so far back as 1901.

Rio observations (Rio is in about 23° south latitude) might be made use of in determining the general distribution of pressure in the neighbourhood of South America, and it is proposed to make use of observations from Alice Springs, New South Wales, in the 24th parallel of south latitude, for a similar purpose.

We require from Germany copies of the logs of all the ships on the list supplied, and referred to in paragraph 2, page 3, except those of the "Buckingham" and "Tinto Hill," from which vessels we have received the necessary observations.

The ships named on this list sail under the flags of England, France, Germany, and the United States, with an occasional ship from some other nation. As a rule they are sailing vessels engaged in the trade between Europe and the United States ports of the Pacific coast, and between Australia and the same ports. There are also several steamers on the list which have been trading between the Cape of Good Hope and the Southern States.

Observations from vessels rounding Cape Horn, and from those in the trans-Pacific trade will be especially useful, as we have few of them.

Arrangements are being made with the New Zealand Shipping Company and with the Shaw, Savill and Albion Company for the extraction of wind, pressure, and temperature observations in the Southern Ocean, from logs kept on board steamers owned by those Companies trading to and from New Zealand, between 1st October, 1901, and 31st March, 1904.

Germany appears to have at her disposal more data in connexion with recent Antarctic exploration than this country has collected, and commenced dealing with her material some months—probably twelve months—ago.

Reverting to page 2 of Professor Drygalski's letter, and relating to paragraph 4, in order to obtain a synchronous observation from an ordinary form of log containing four hourly observations, local time, the time at place corresponding to noon G. M. T., is first found for each day. Two four-hourly entries nearest to and each side of G. M. N. are then taken out, and the nearest approximation to the G. M. N. value at the place obtained by interpolation.

A.C.H.

It was agreed that the Royal Society Committee be consulted upon the question of the form of publication of the observations at winter quarters raised by Professor von Drygalski.

1147. *Colonial Observations.*—Read—The following letters :—

M.O. 2,866.

Downing Street,
15th December, 1904.

SIR,

I AM directed by Mr. Secretary Lyttelton to transmit to you a copy of a letter from the Weather Bureau of the United States Department of Agriculture suggesting an exchange of publications containing meteorological tables or climatic data of any kind.

I am to state that this Department is not in the habit of distributing gratuitously the Annual Colonial Reports, such as that (No. 419) (Cd. 17,628-24) on Weihaiwei alluded to in the Bureau's letter ; but if, as is believed, the Meteorological Office receives from the Colonies generally from time to time a good deal of meteorological information, I am to suggest that it would be convenient if the Meteorological Council could arrange with the Bureau at Washington for the exchange of any publications that might be of mutual interest.

I am to request that the list of Publications enclosed with this letter may be returned to this Department.

I am, &c.,
C. P. LUCAS.

The Secretary,
Meteorological Office.

M.O. 2,866.

U.S. Department of Agriculture,
Weather Bureau,
Washington,
18th November, 1904.

SIR,

THE Geographical Journal for November, 1904 (page 589), contains a reference to "a recent colonial report on Weihaiwei" which "contains meteorological returns." If this report is available for free distribution, it is requested that you will kindly forward a copy to this Library.

The Weather Bureau would be very glad to receive any other reports published by your office, from time to time, which contain meteorological tables or climatic data of any sort. In return

therefor, it will give us pleasure to supply you with any of our own publications which you may desire, so far as they are available for distribution. A list is enclosed herewith.

Such exchanges may be made, free of expense for transportation, through the medium of the Smithsonian International Exchange Service, care of Messrs. William Wesley and Son, 28, Essex Street, Strand, London.

By direction of the Chief of Bureau, very respectfully,

(Signed), H. H. KIMBALL,
Librarian.

Superintendent of Printing,
Colonial Office, Downing Street,
London, S.W.

It was agreed to return the following reply :—

M.O. 2,866.

Meteorological Office,
63, Victoria Street, London, S.W.
13th January, 1905.

SIR,

WITH reference to your letter 40,389/1904, of the 15th December, 1904, enclosing a copy of a letter of 18th November, 1904, from the United States Weather Bureau, I am directed by the Meteorological Council to explain that the Weather Bureau is regularly supplied with copies of all the publications issued by the Council, and we receive all the publications of the Bureau in exchange.

The request of the Weather Bureau has reference to meteorological information which is contained in Colonial Reports and is not included in the publications issued by the Council. Questions of a similar nature have formed the subject of correspondence between the Council and the Foreign Office and the Colonial Office on various occasions.

Unfortunately there is no regular organisation in this country, for issuing collections of such reports; certain summaries are included in the statistical abstract of the Board of Trade, Cd. 1325, 1902. The Council have recognised for a long time the economic advantage that would result from setting out the climatological conditions of the British Colonies and Dependencies in a compendious manner; and an extract from the last issue of the "Meteorologische Zeitschrift," the leading meteorological Journal, which I beg leave to enclose herewith, is sufficient evidence of the view taken of the matter by meteorologists.*

The Council lose no opportunity open to them of dealing with the meteorology of the Colonies, and they notice with regret that the organisation of the meteorology of the West Indian Colonies is now passing into the hands of the Weather Bureau of the United States. The voluntary work of Mr. Ravenstein enabled them to deal recently with the observations in Tropical Africa, but they have not the means of dealing with the meteorology of the Colonies in an organised manner.

The Council would gladly welcome any suggestions from the Colonial Office upon the matter, which appears to them to be one of great importance, not only for the science of meteorology, but for the economic interest of the Colonies themselves.

I am, &c.,
W. N. SHAW,
Secretary.

The Under Secretary of State,
Colonial Office, S.W.

1148. *Instruments for the Colonies* (Minute 1052).—Read—The following letter from the Crown Agents :—

M.O. 2,853.

Stores Circular No. 2.—Meteorological Instruments.

Whitehall Gardens,
London, S.W.
14th December, 1904.

SIR,

WITH reference to our memorandum of the 1st October, in which we forwarded to you copies of our letter to the Colonies respecting the supply of meteorological instruments, I enclose for your information copies of the replies which we have received to date. Acknowledgments have also been received from St. Vincent, St. Kitts, Grenada, St. Lucia, Federated Malay States, and Southern Nigeria.

2. The only reply which calls for comment is that from Cyprus, and I should be glad if you would furnish us with the extra copies of the circular asked for in the first paragraph of the Chief Secretary's letter.

3. I would also ask you to kindly furnish us with your views on the points raised in the remainder of the letter.

I am, &c.,
M. A. CAMERON.

The Secretary,
Meteorological Office,
63, Victoria Street, S.W.

* Ergebnisse der meteorologischen Beobachtungen in den Britischen Colonien und anderen auswärtigen Stationen (Meteorologische Zeitschrift, November, 1904).

Enclosures.

The Colonial Secretary, Jamaica, to Crown Agents, 22nd October, 1904.
The Colonial Secretary, Barbados, to Crown Agents, 1st November, 1904.
The Colonial Secretary, Bahamas, to Crown Agents, 4th November, 1904.
The Chief Secretary, Cyprus, to Crown Agents, 1st December, 1904, and Enclosures in original.

9815/11272.

The Colonial Secretary, Jamaica, to Crown Agents.

Colonial Secretary's Office,
Jamaica,
22nd October, 1904.

GENTLEMEN,

I AM directed by the Governor to acknowledge with thanks the receipt of your letter No. E/345/2 in regard to the supply of meteorological instruments, and to inform you that as there is no official Meteorological Office in Jamaica it is not probable that this Government will require instruments of the kind mentioned.

I have, &c.,
(Signed) H. CLARENCE BOURNE,
Colonial Secretary.

No. C/A 139.

The Colonial Secretary, Barbados, to Crown Agents.

Colonial Secretary's Office,
Barbados,
1st November, 1904.

GENTLEMEN,

I AM directed by the Governor to acknowledge the receipt of your circular letter No. E/345/2 of the 27th of September informing me of the terms upon which the Meteorological Council is willing to supply instruments for the use of Colonial Governments.

2. His Excellency desires me, in thanking you for your letter, to state that this Government is already supplied with all the meteorological instruments that it at present requires.

I have, &c.,
(Signed) S. W. KNAGGS,
Colonial Secretary.

No. 551/838.

The Colonial Secretary, Bahamas, to Crown Agents.

Colonial Secretary's Office,
Nassau,
4th November, 1904.

GENTLEMEN,

I AM directed by His Excellency the Administrator to acknowledge the receipt of your Stores Circular No. 2 of the 27th September with respect to the supply of meteorological instruments to the Colonies, and to inform you in reply that, as the Meteorological Office in the Bahamas is in daily communication with Washington, it is found to be more convenient to obtain our standard instruments from the United States.

I have, &c.,
(Signed) W. R. HUNT,
Acting Colonial Secretary.

No. 2561/1904.

The Chief Secretary, Cyprus, to Crown Agents.

Office of the Chief Secretary to Government,
Cyprus,
1st December, 1904.

GENTLEMEN,

IN reply to your Circular No. E/345/2 of the 27th September, 1904, on the subject of meteorological instruments, I have the honour to inform you that a copy of Circular 55, "Memorandum on the requirements of a normal climatological station," and Circular Official No. 162, "Hints to meteorological observers in tropical Africa," have been supplied to the Director of Public Works, and as he has applied for four more copies of each circular, I shall be obliged if you will kindly obtain and forward them to me.

2. I will be glad if you will ascertain from the Meteorological Office whether the form now used by the Public Works Department, copy enclosed, which, although not quite in the same order, gives all the information usually recorded in the Meteorological Office, may be continued to be used as the observers here have now got accustomed to it.

3. Hitherto a "Stevenson's screen" has always been used, but it is observed from the two pamphlets that this is not recommended for the Tropics, and as Cyprus lies about half way between the Tropics and the Temperate Zone, therefore advice is desired as to whether it is better for us to use a Stevenson's screen or that recommended in the blue pamphlet (Official No. 162).

4. I append a list of the instruments now in use at our various observatories, and should be glad to know whether the records of these would be accepted by the Meteorological Office. The Director of Public Works states that "so far as I know all instruments are first class."

I have, &c.,
(Signed) T. H. HATTON RICHARDS,
for Chief Secretary.

1149. *Fishery Barometers* (Minute 1119).—A draft of a letter (P.C. 133) from the Secretary to Sir T. H. Elliott was approved.

1150. *Wireless Telegraphic Reports from the Atlantic.*—It was agreed to make an application to the Marconi Company for facilities for telegraphic reports from Atlantic liners, and a draft letter (P.C. 264) to the Managing Director of the Company was approved.

1151. *Sea Temperature Observations* (Minute 1116)—Read—The following letter :—

M.O. 94.

Irish Lights Office,
Carlisle Building,
Dublin,
9th January, 1905.

SIR,

I HAVE to acknowledge the receipt of your letter of the 29th ultimo, asking if the Commissioners of Irish Lights will supply your office with air and sea temperature observations from certain Stations on the Irish Coast, for use in connection with the Pilot Chart of the North Atlantic and Mediterranean.

In reply I have to inform you that this work has from time to time been carried out by the Commissioners at several of their stations, for various Public Departments, and they will have much pleasure in supplying you with similar information if you will forward the necessary instruments and record forms for the purpose.

I may mention that the Admiralty allowed a remuneration of £1 per month, to each Station at which similar observations were recorded for their use.

I am, &c.,
JOHN ARMSTRONG,
Secretary.

The Secretary,
Meteorological Office.

It was agreed to send a reply to the effect that the Council do not know the circumstances under which the Admiralty allowed a remuneration of £1 per ~~week~~ month, but that they hope that the observations may be sent without any payment being required as they are already in the case of the Coningbeg and South Rock Lightships on the Irish Coast and many others on the English and Scottish Coasts.

1152. *Telegraphic Reporting Stations—Stornoway* (Minute 1118).—Submitted—Correspondence (M.O. 2950, 1904, and M.O. 55) with reference to the arrangements for the supply of daily telegraphic reports at 8.30 p.m. to the "Daily Telegraph" in which the observer suggests that he will make his own arrangements with the Editor.

The Secretary was directed to reply that as the observations at Stornoway form part of a general system for the British Isles the Council would object to any independent service of observations being organised at one of their stations, and to inform the Editor of the "Daily Telegraph" of the Council's view of the matter.

1153. *Observations of Atmospheric Electricity.*—Submitted—The following letter and materials for reply :—

M.O. 85.

Mariemont,
Edgbaston,
23rd December, 1904.

MY DEAR SHAW,

WILL you be good enough to tell me whether during fog there is always one sign of electricity in the air, or whether the electrical manifestation is different according to the different kinds of fog? If there is one sign I should be glad to know which it is. Pardon my troubling you, but I need trustworthy information, and testimony is usually vague.

Yours very truly,
OLIVER LODGE.

In response to Sir Oliver Lodge's inquiry I have examined the electrograms from Kew Observatory for the hours specified in Table A of the fog report for 1901–2 and in Table B of that for 1902–3. It is clear that the sign of the electrification is as a general rule positive; in most cases a marked increase in the positive potential is shown, so much so that the trace frequently leaves the paper on the positive side.

A negative potential does, however, occasionally occur. The sign of the electrification became reversed on 13 occasions during the 96 days of fog dealt with in the two tables referred to, but the duration of the reversal was always small. Of these 13 occasions eight occurred at times of cloud fog, or in the initial stages of cloud fog, when the trace of the Beckley rain-gauge showed rain or sleet.

I have tried to ascertain whether there was actually fog at Kew on these occasions of reversed electrification by comparing the electrogram with the fog returns sent to the Office from the

Observatory, but as many of the reversals occurred during the night and the Kew fog record was only kept during the daytime (commencing 7 a.m.) a comparison has only been possible in the following cases :—

Date.	Electrogram.	Fog and Weather Record.
February 8th, 1902 ...	Very rapid and large oscillations, 9 a.m. Noon—curve frequently off paper, both directions.	Moderate fog, 10.30 a.m. to 2 p.m.; continuous rain or snow, 9 a.m. till noon.
February 15th, 1902 ...	Occasionally negative between 7 a.m. and 8 a.m.	Moderate fog at times till noon; steady rain, 6.45 a.m. till 10 a.m.
November 14th, 1902...	9 a.m., temporary fall to negative value.	Light white fog (2 w.) till 4 p.m. No rain measured.
January 5th	Generally negative (insulation queried).	Very damp, steady rain till 10 a.m.; drizzle later. No fog mentioned.
January 8th	Strongly positive till 10 a.m., negative 1 p.m. to 2 p.m.	Light white fog (2 w.), noon to 2 p.m.; drizzle, 12.30 p.m. to 2.30 p.m.
January 18th	High negative value till 7 a.m., then strongly positive.	Light white fog (1 w.) at 7 a.m.; moderate white fog (3 w.), afternoon; steady rain till 7 a.m.
January 19th	Sudden fall to high negative value at 9 a.m.	Light white fog (2 w.) all day; slight drizzle, 9 a.m.
November 5th, 1901 ...	Slightly negative from midnight to 1 a.m. During remainder of night a high positive potential was maintained.	Thick fog came on 6 p.m., November 4th, thick fog on morning of 5th till 10.30 a.m. No record during night as to whether fog was continuous. No rain registered.

Approved.

1154. *Ben Nevis Observatories* (Minute 1105).—The Secretary reported that he had received a request (M.O. 2,880, 1904) from Mr. Omond to have the self-recording instruments removed from Fort William by the end of 1904, and had given instructions to Kew Observatory to send an assistant to pack and remove the apparatus (M.O. 216, 1905).

Read—M.O. 2,869 from Mr. Spence, of Deerness, suggesting the installation of the self-recording apparatus in the Orkneys.

The Secretary was directed to reply that the Council are not in a position to consider the establishment of an additional first order station.

1155. *Admiralty Instruments—Closing of Naval Establishments.*—Read—The following letter :—

M.O. 99.

Hydrographic Department, Admiralty,
Whitehall, London, S.W.,
9th January, 1905.

SIR,

I BEG to inform you that consequent upon the closing of the Naval Establishments at Halifax, Jamaica, Esquimalt, Trincomalee, and Ascension no further supplies of meteorological instruments will be required for those establishments. Instructions have been given for the return to the Meteorological Office of the meteorological instruments at present in store at those places.

I am, &c.,
A. MOSTYN FIELD,
Hydrographer.

The Secretary,
Meteorological Office.

1156. *Admiralty—Suggested Apparatus.*—Read—The following letter :—

M.O. 2,933.

Admiralty,
21st December, 1904.

SIR,

I AM commanded by My Lords Commissioners of the Admiralty to forward herewith for the information of the Meteorological Council sketches and descriptions of two electrical machines invented by Sub-Lieutenant Cecil H. B. Govan, of the Royal Naval College, Portsmouth, for the

purpose of ascertaining from a distance of several hundred miles the atmospheric conditions prevailing in any outlying island, without keeping an observer there. I am to request that you will be so good as to inform Their Lordships whether the Meteorological Council desire to utilise the invention.

I am, Sir, &c.,
EVAN MACGREGOR.

The Secretary,
Meteorological Office.

THE "BARO-TELEMETER."

Consists of a large Aneroid Barometer (about 1′ or 1½′ in diameter), having a raised graduated arc "R" composed of a series of resistances (fairly *high*, so as to be appreciable when added to the cable's resistance).

The *needle* can travel up and down the keyed shaft "S" being kept up to a small stop by the weak spring, so that the needle-point just clears the arc; above (or below) the needle, and on the ebonite shaft, is an electro-magnet; the main circuit "C" passing round it and then being connected to the needle itself.

ACTION.

The current enters from the cable "C" the terminal "T" and thence passes round "E" the electro-magnet, down into needle and through brush "B" into pedestal "P" (arm between "B" and "P" is rigid) and away through return circuit "C."

This *auxiliary circuit** causes the electro-magnet "E" to repel (or attract) the needle "N" overcoming the spring, so that it touches the arc "R" at the graduation showing the height of the barometer at the moment. The current runs *through the resistances* to the return terminal at zero (zero as convenient) and away through return wire lead. When adjusted, the ammeter at Hong Kong, say, shows amount of extra resistance and thus the height of the barometer.

ELECTRICAL WIND RECORDER.

This is on the same principle as the Baro-Telemeter, namely, the current in the auxiliary circuit making an electro-magnet "E" and bring the needle "N" down into a graduated resistance arc (which is broken by an insulating strip at about N. 1° W), and, by the variations of the current shewn by the adapted Ammeter at the Observatory, showing how much of the resistance (*i.e.*, the compass-ring, from "N" round towards "E," "S," "W" and "N") has been included in the circuit, and consequenty indicating the position the needle has been placed in by the wind vane.

The *force* of the wind is shewn by the interval of time between the breaks in the current caused by the segment of insulator inserted into the wheel which revolves in the mercury trough.

The instrument is placed on an elevated position on the "rock" and turned until the "N" point of the compass ring is towards the north, and so fixed. The wind will turn the vane into its plane of action, and cause the rotator (adjustable) to move round, consequently rotating the interrupted wheel "W."

The main pivot is pivoted in the wooden base of the instrument, and, at its upper end carries the rotator's axis, with the rotator at one end and the wheel at the other, with a hand brake to be adjusted, and a lubricator in the gland. The needle moves round with the spindle, but can travel up and down about ¼ inch.

ELECTRICAL ACTION.

The current enters from main cable as shown by the arrows, and flows round "E" the electro-magnet, and thence up "B" the pedestal which permanently supplies the needle with the current.

It then travels up the arm "A" (which connection is broken on needle dropping, as it is a rubbing contact), and thence away return circuit.

The needle then is attracted down on to plate, and by the contact thus made, flows against the hands of a watch to the "N" point terminal, whence it is supplied to the Rotator Axis, and through the wheel to the mercury, and away to the return cable.

While the operator's key is kept pressed, the needle of his adapted Ammeter goes round to the point of the compass indicated, and gives a "flick" as the circuit is momentarily broken. Hence you have both direction and force of the wind.

Both instruments are small, especially the Baro-Telemeter, and could be placed in a small iron hut of four or five feet each side, with the vane and rotator outside, protected by a small cage erection.

"M" = Mercury Trough
"I" = Insulator
} N.B.

Rubbing contacts made by copper wire brushes.

Submitted—the following reply :—

SIR,

THE Meteorological Council have given careful consideration to the description of proposed instruments by Sub-Lieutenant Cecil H. B. Govan, enclosed with your letter 11891 19107a, 1904, for the indications at a distance of barometric pressure, the force and direction of the wind by means of automatic electrical devices.

Auxiliary circuit is broken at "B" when needle dips into the arc and the main circuit still keeps "E" magnetised until circuit is broken at observing station.

With regard to inquiry of their Lordships as to whether the Council desire to utilise the invention, the Council recognise not only the utility of an apparatus which would effectively transmit observations of pressure and wind to a distance by cable, but also the ingenuity and skill displayed by Sub-Lieutenant Govan in the design of the instruments. There are, however, some points which require consideration.

(1) Barometric observations for meteorological purposes must be such as to be comparable with corresponding observations made at other times or places; but it is found in practice that it is not possible to use the observations of aneroid barometers in this manner unless there is provision for very frequent comparison of the readings with a standard mercury barometer.

(2) In the experience of the Council it is found that meteorological apparatus depending upon varying electrical contacts requires almost continuous personal attention to all the working parts, and they would anticipate great, indeed insuperable difficulty, in maintaining such electrical arrangements as those proposed by Sub-Lieutenant Govan at an isolated and generally unvisited spot.

The Council do not wish to be understood as expressing the opinion that such difficulties cannot be overcome by suitable design and if the apparatus of Sub-Lieutenant Govan is actually in the form of a working model they would be greatly interested to learn how it is found to work from this point of view, and they would be glad of an opportunity of inspecting it.

Apart from these considerations the cost of maintaining a cable of any considerable length in working order would be prohibitive so far as the Council is concerned.

I am, Sir, &c.,

1157. *Paper on the Seasons in the British Isles.*—The Secretary reported that he had been requested by the Royal Statistical Society to read a paper on Meteorological Statistics before that Society, and that he proposed to give an account of the statistical method of representation of climatological data adopted by the Council for the Weekly Weather Report in 1878, on the recommendation of the Land Meteorology Committee, and revised in 1883; and to deal with the application of the method to the representation of the seasons in a paper to be entitled "The Seasons in the British Isles since 1878," on March 21st next. He reported further that he had employed Miss B. Smith, overtime, in the preparation of some tables in connection with the paper and desired authority to pay the charge £1 12*s.* 7*d.*, he also requested authority to incur further expenditure for overtime work on the subject, and to report upon the matter further at a future meeting.

Approved.

1158. *International Conference at Innsbruck.*—The Secretary was authorised to attend the Conference of Directors and Superintendents of Meteorological Establishments at Innsbruck, in September next, and also to comply with the request (M.O. 2,900) of the Société Belge d'Astronomie de Météorologie et de Physique du Globe to act as a member of the jury in an international competition in weather forecasting, if he thought fit.

1159. *Publications.—Official Copies.*—It was agreed to requisition 50 additional official copies of Publication No. 44, "Report on Gales in the Ocean District adjacent to the Cape of Good Hope," the office stock having been exhausted.

1160. *Storm Signal Stations.—Gorleston.*—Read—M.O. 2,077 from the Harbour Master at Gorleston asking for a cone and storm warnings to be sent to his office.

It was agreed to consult the Board of Trade upon the matter.

1161. *Logs.*– Eighteen received, one excellent (Captain J. C. Robinson), also one short log and one lighthouse register.

1162. *Storm Warnings:—*

Signals hoisted on 12 days; total number of districts warned 67.

In 36 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 22 districts by subsequent strong winds (force 7 or 6). In 9 districts they were not required.

Gales experienced for which no warnings were issued.—None.

1163. *Inspection Reports* (Minute 1,097).—The Secretary was authorised to send copies of the inspection reports to the observers in the same manner as last year, to take any necessary action upon the reports, and to report further at a future meeting.

1164. *Forecasts*—Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of November, 1904.

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	57	73	65	94
,,	b	27	24	26	
,,	c	16	3	9	
,,	d	0	0	0	
Scotland, E.	a	47	47	47	79
,,	b	30	33	32	
,,	c	20	17	18	
,,	d	3	3	3	
England, N.E.	a	70	50	60	89
,,	b	20	37	29	
,,	c	7	10	8	
,,	d	3	3	3	
England, E.	a	53	50	52	94
,,	b	37	47	42	
,,	c	3	3	3	
,,	d	7	0	3	
Midland Counties	a	50	50	50	87
,,	b	27	47	37	
,,	c	13	3	8	
,,	d	10	0	5	
England, S.	a	57	44	51	91
,,	b	27	53	40	
,,	c	13	3	8	
,,	d	3	0	1	
Scotland, W.	a	60	77	69	89
,,	b	24	17	20	
,,	c	13	6	10	
,,	d	3	0	1	
England, N.W.	a	50	57	54	92
,,	b	40	37	38	
,,	c	7	3	5	
,,	d	3	3	3	
England, S.W.	a	70	64	67	85
,,	b	13	23	18	
,,	c	17	10	14	
,,	d	0	3	1	
Ireland, N.	a	43	73	58	82
,,	b	30	17	24	
,,	c	20	3	11	
,,	d	7	7	7	
Ireland, S.	a	33	60	47	77
,,	b	33	27	30	
,,	c	27	10	18	
,,	d	7	3	5	
Summary.					
British Islands	a	54	59	57	87
,,	b	28	33	30	
,,	c	14	6	10	
,,	d	4	2	3	

1165. *Accounts* (i.).—Submitted—The following Statement of Accounts for the six months ending 30th September, 1904 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1903–1901	—	1,489 12 7	Administration :		
Proportion of vote ..	—	7,000 0 0	Secretary	300 0 0	
Repayment of expenses charged under—			Salaries and wages ...	543 4 0	
(1.) Incidental expenses	8 4 6		Rent, fuel, and lighting	355 12 3	
(2.) Observatories ...	19 13 1		Incidental and contingent expenses ...	228 15 2	
(3.) Special researches	12 8 0		Furniture, fittings, &c.	13 14 3*	
		40 5 7	Expenses incidental to International Meteorological Congress...	—	
			Special Researches :		1,441 5 8
Supply of Information :			Salaries and other charges	—	425 4 5
Weather Forecasts, Reports, &c. ...	246 9 6		Land Meteorology :		
Telegrams sent abroad	440 13 7		Observatories and stations, including remuneration of observers	1,090 3 8	
		687 3 1	Salaries :— Discussion and reduction of observations, &c. ...	926 16 2	
Supply of Instruments, &c. :			Weather Information and Forecasts :		2,016 19 10
Repayment of cost of M.O. instruments purchased by observers	73 19 6		Telegraphic reports and storm warnings, remuneration of observers, &c.	939 5 8	
Repayment of cost of other commissions...	71 9 5		Salaries:—Preparation and issue of reports and forecasts ...	732 1 4	
		145 8 11	Inspections :		1,671 7 0
Charges for Commission :			Salaries and travelling expenses	—	4 15 6*
On supply of instruments, &c.	—	10 14 6	Ocean Meteorology :		
			Salaries :— Discussion and reduction of observations... ...	705 16 6	
Superannuation Account :			Expenses incidental to the supply of instruments :—		
Annuities	142 16 4		Proportion for care and issue of instruments	85 0 0	
Interest on Investment	20 14 3		Royal Navy ...	276 6 3	
		163 10 7	Mercantile Marine ...	298 6 10	
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	1,365 9 7
			Superannuation :		62 13 11
			Pensions and allowances...	414 13 2	
			Invested	750 0 0	
			Balance :		1,164 13 2
			Cash at Bank... ...	1,276 9 6	
			„ at Office ...	52 16 8	
			Advances for Travelling Expenses ...	55 0 0	
					1,384 6 2
		£9,536 15 3			£9,536 15 3

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors (partly estimated)	1,446 13 10	By cash at Bank and at Office ...	1,329 6 2
„ balance	763 9 1	„ H.M. Exchequer	650 0 0
		„ sundry debtors (including advances for travelling)	230 16 9
	£2,210 2 11		£2,210 2 11

Note.—On September 30th the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £2,156 4*s.* 1*d.*

* Some expenses not brought to account.

—— (ii.) Submitted—The following statement :—

	£	s.	d.
Cash balance on 13th December, 1904	2,469	7	8
Receipts from 14th December–10th January ...	5,131	5	1
	7,600	12	9
Cheques drawn from 14th December–10th January	1,970	11	7
Cash balance on 10th January, 1905...	£5,630	1	2

—— (iii.) The payment of £7 10*s.* to Mr. W. H. Dines for the maintenance of the base station at Crinan in June and July, 1904, during the kite experiments on H.M.S. "Seahorse," was authorised.

1166. *Reports of Work* for the month of December were submitted and approved.

1167. *Library.*—A list of publications received since last meeting was laid on the table.

63, *Victoria Street, S.W., 25th January*, 1905.

PRESENT :

PROFESSOR DARWIN (IN THE CHAIR).

Captain FIELD, *Hydrographer.* | MR. SHAW (*Secretary*).

1168. The Minutes (1145–1167) of the last meeting (11th January) were read and confirmed.

1169. *Royal Society.*—A correspondence, forwarded by Professor Larmor, between the Royal Society and the Treasury was read, and the Secretary was directed to inform the Royal Society that the Council were prepared to assist the Royal Society in the matter in any way that may be desired.

1170. *Sea Temperature Observations* (Minutes 1116, 1151).—A draft of a letter to the Irish Lights' Office (P.C. 300) was approved.

1171. *Telegraphic Reporting Stations, Stornoway* (Minutes 1118, 1152).—Read—M.O. 166 from Mr. Mackenzie. It was agreed that the necessary expenses of the messenger for the 8.30 p.m. service of observations for the "Daily Telegraph" be met by an increase of the payment, the additional payment for observations remaining at £6 per annum.

1172. *Admiralty—Suggested Apparatus* (Minute 1156).—The draft letter of minute 1156 (M.O. 2933) was approved after amendment.

1173. *Paper on the Seasons in the British Isles* (Minute 1157).—The Secretary submitted a memorandum showing a remarkable relation between the yield of wheat for England and the dryness of the previous autumn as represented by the statistics of rainfall for the Principal Wheat Producing Districts for the 36th to the 48th weeks of the Weekly Weather Reports.

It was agreed that steps be taken for the immediate publication of the comparison of the data.

1174. *Conference at Innsbrück.*—Read—The following letter from the Seewarte and materials for a reply.

M.O. 2,934.

Hamburg,
den 16, Dezember, 1904.

Mit Rücksicht auf den nächstjährigen meteorologischen Congress in Innsbrück erachet die Deutsche Seewarte den Zeitpunkt für gekommen, über die Art der Reduktion der Barometerstände auf das Meeresniveau eine Vereinbarung unter den Direktoren der meteorologischen Netze anzuregen, nachdem eine Einigung über diese Frage von dem Internationalen Meteorologischen Comitée in Paris, im Jahre 1896, als Beschluss zu Frage 18 des Programms, als Aufgabe der Direktoren der meteorologischen Netze bezeichnet worden ist.

Um eine Einigung anzubahnen, beehrt sich die Deutsche Seewarte, umstehend Vorschläge zu unterbreiten, die gleichzeitig auch den übrigen Meteorologischen Zentralstellen Europas, soweit diese an den in Europa erscheinenden Wetterberichten beteiligt sind, zugehen und dem Internationalen Meteorologischen Comitée zur Kenntnis gegeben werden, da es sich um ein Vorgehen in Ausführung früherer internationaler Beschlüsse handelt.

Die Deutsche Seewarte bittet um sehr gefällige Aeusserung bis spätestens ende Januar, indem die Absicht besteht, auf Grund dieser vorläufigen Feststellungen möglichst bei Gelegenheit der nächstjährigen Meteorologenconferenz in Innsbrück eine definitive Vereinbarung herbeizuführen, und zu diesem Zwecke noch weitere, zur Zeit nicht übersehbare Massnahmen erforderlich sein werden.

In dem sehr gefälligen Antwortschreiben sind insbesondere auch *genaue* Angaben erwünscht, in welcher Weise dortseits zur Zeit die Barometerstände für die Wetterberichte auf das Meeresniveau reduziert werden. Es besteht die Absicht, zunächst die einlaufenden Antwortschreiben zuzammenzustellen und den beteiligten Zentralstellen zur genauen Orientierung möglichst bald bekannt zu geben.

HERZ.

An das Meteorological Office,
London, S.W.,
63, Victoria Street.

Einigung über die Art der Reduktion der Barometerstände auf das Meeresniveau für die Aufgaben der Wetterberichte.

1. Eine Einigung über die Art der Reduktion der Barometerstände auf das Meeresniveau, in Ausführung des betreffenden Beschlusses der Internationalen Conferenz zu Paris im Jahre 1896, erscheint für die Aufgaben der Wetterberichte dringend geboten.

2. Es muss vermieden werden, dass auf derselben Wetterkarte über wenig ausgedehnten Gebieten verschiedene Arten der Reduktion nebeneinander bestehen.

3. Die Schwierigkeit der Ermittlung der im Einzelfall zu benutzenden Mitteltemperatur der Luftsäule ist nicht zu lösen. Auch die von Bigelow in den Vereinigten Staaten von Nordamerika entwickelte Methode kann nicht als eine Lösung der Schwierigkeit betrachtet werden, wenn sie auch für die in jenem Lande vorliegenden besonderen Verhältnisse gewiss relativ Gutes zu leisten vermag.

4. Das Nebeneinander von verschiedenen Methoden ist schlimmer als die gemeinschaftliche Verwendung einer und derselben Methode, selbst wenn diese möglicher Weise in der Mehrzahl der Fälle von einer andern übertroffen werden sollte.

5. Soll nicht auch hier das Bessere als Feind des Guten gelten, so ist eine baldige Einigung über die Reduktionsmethode dringend geboten. Eine solche Vereinbarung erscheint auch insofern ganz unbedenklich, als der Uebergang zu einer anderen Methode in einfacher Weise durch Beschluss einer späteren Internationalen Conferenz herbeigeführt werden könnte, sobald sich die Vorteile einer neuen Reduktionsmethode herausgestellt haben sollten.

THE M.O. REDUCTION OF BAROMETRIC OBSERVATIONS TO M.S.L.

The Tables used in the Office were calculated by Mr. Strachan prior to the year 1875. They give the corrections to be applied for heights up to 1,500 ft. at 30 ins. and 27 ins. respectively at temperatures between −10° and 100° F. For intermediate pressures interpolated values are used.

Mr. Strachan explains that he calculated the tables from the formula given in the introduction, viz. :—

$$\text{Log}\,\frac{h}{h'} = f \div 60159\,(1 + \frac{t + t' - 64}{900})\,(1 + \cdot00268\cos 2l)\left(1 + \frac{f + 52251}{20{,}886{,}861}\right)$$

h and h′ are barometer readings in inches at 32° F.
f the height of the station, l the latitude.

I have traced this formula to Guyot's tables published in 1859. It is based on a formula in Laplace's Mécanique Céleste.

Very old values have been used for the various physical constants involved.

The "barometric constant" $\left(\frac{\text{height of homogeneous atmosphere}}{\log e}\right)$ has been taken at 60159, whereas the tables of the International Meteorological Committee give 60368·6.

The co-efficient of expansion of air is taken as $\frac{1}{450}$ and not as $\frac{1}{491}$.

I am unable to trace what, if any, temperature gradient has been assumed.

Our highest telegraphic reporting stations are—

Malin Head	230 ft.
Oxford	208 ft.

The following calculations have been made as a guide in estimating the magnitude of the corrections involved.

Using the simple formula $\log \frac{h}{h'} = f \div 60369\,(1 + \frac{t + t^1 - 64}{1000})$ at 300 ft., 30 ins. and 50° F

(1) Assuming a uniform temperature of 50° at all elevations up to 300 ft.
Correction for reducing to M.S.L. = 0·3333 ins.

(2) Assuming a gradient of 1° F. for 300 ft.
Correction... ... ... = 0·3336 ins.

If a correction is introduced for the variation of gravity the formula becomes (*see* tables of International Meteorological Committee) $\log \frac{h}{h'} = f \div 60369\,(1 + \frac{t + t' - 64}{1000})\,(1 + \cdot00259\cos 2\lambda)\left(1 + \frac{f}{R}\right)(1 + \frac{5}{4}\frac{K}{R}\log e)$ where R is radius of earth.

Applying this correction the values of the above corrections become 0·3324 ins. and 0·3327 ins. respectively in latitude 52°.

The tables now in use give 0·329 ins. at 300 ft., 30 ins. and 50°.

At 1000 ft., 50° and 30 ins. we have—

Correction (Zero temperature gradient)	= 1·1250 ins.
„ (1° per 300 ft.)	= 1·1253 ins.
„ (1° per 300 ft., and applying gravity corrections)	= 1·1256 ins.
Value now used in Office	= 1·059 ins.

CORRECTION OF BAROMETER READINGS FOR THE VARIATION OF "G" WITH LATITUDE.

The Tables published by the International Meteorological Committee give the following formula :—

$$g_\lambda = g_{45}\,(1 - k\cos 2\lambda).$$

λ = latitude.
k = a constant = ·00259.

The following table gives the values of the correction at different latitudes at pressure of 28 and 31 ins. respectively :—

Latitude.	At 27 inches.	At 31 inches.
°		
0	− 0·070	− 0·078
50	+ 0·012	+ 0·014
51	+ 0·015	·017
52	+ 0·017	·019
53	+ 0·019	·022
54	+ 0·022	·025
55	+ 0·024	·027
56	+ 0·026	·030
57	+ 0·028	·033
58	+ 0·031	·035
59	+ 0·033	·038
60	+ 0·035	+ 0·040
90	+ 0·070	+ 0·078

Variation of gravity with altitude—

$$g_{\lambda h} = g_{\lambda}\left(1 - \frac{5}{4}\frac{h}{R}\right)$$

h = height above M.S.L.
R = radius of earth.

$$\frac{g_{\lambda h}}{g_{\lambda}} = 1 - \cdot 000,000,059,7\ h.$$

At 4,000 ft. elevation and 30 ins. pressure the correction due to this cause amounts to ·007 inch.

Approved.

1175. *Publications—Barometer Manual* (Minute 1071).—Submitted—Text and illustrations for revised edition.

Referred to the hydrographer.

1176. *Daily Charts of the Atlantic—Checking of Barometer readings* (Minutes 1047, 1109).—The Secretary reported that a representative of the Board of Trade had called on Friday, January 20th, and had explained that the Board of Trade recognised the importance of suitable provision being made for the testing of the instruments used on Transatlantic Liners, and were willing to promote the establishment of an effective scheme. It was explained that an actual inspection aboard each ship by a Board of Trade official would involve a special visit for the purpose by the official to the ship, that the ships were not infrequently moored a long way from the Board of Trade offices, and that the duty of inspecting the instruments would be so far an addition to the work of the officials that it would practically require special consideration.

The Custom House Officers are the only authority that board every ship on arrival.

While not unwilling to proceed further in the matter if pressed by the Council to do so, the Board of Trade suggested that the Council should endeavour in the first instance to obtain the necessary correction readings by means of observations at 8 a.m. or 6 p.m., and should address a general request for such readings to the officers who forward observations to the office.

It was resolved to call attention to the importance of having the means of checking the accuracy of all instruments used for observations intended for synoptic charts in a note upon the subject upon the next pilot chart, and to issue a circular to the contributors of observations asking them for their co-operation as suggested by the Board of Trade.

1177. *Fishery Barometers—Board of Agriculture and Fisheries* (Minute 1149).—Read—M.O. 155. The Secretary reported that he had had an interview with Sir T. H. Elliott upon the subject and that it had been suggested that the Fishery Committees or Local Authorities might undertake the duty of reporting from time to time upon the condition of the barometers, and that a form of instructions for an inspection might be supplied. He had accordingly prepared a draft form of questions about the general condition of a barometer and its usefulness to fishermen with provision for testing its accuracy by the reference of readings of the inspector and observers to the pressure distribution of the chart for the day, and had forwarded it to Sir T. H. Elliott.

Approved.

1178. *Fishery Barometer—Worth Matravers.*—Read—M.O. 181 from the Rev. C. S. Shepherd, Vicar of Worth Matravers, asking that a Fishery Barometer should be entrusted to him for the benefit of the local fishermen.

It was agreed that the Board of Agriculture and Fisheries be consulted upon the matter.

1179. *Observations—Kew.*—Read—M.O. 167 from Dr. Chree reporting "rather a serious loss of barometric trace" on account of the transfer of an assistant from Kew to Bushy combined with the defective condition of one of the barograph cylinders.

The Secretary was directed to write to the Director of the National Physical Laboratory upon the matter.

1180. *Forecasts.*—Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of December, 1904 :—

The letters used have the following signification :
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	52	61	57	
,,	b	29	29	29	86
,,	c	16	7	11	
,,	d	3	3	3	
Scotland, E.	a	42	78	60	
,,	b	36	16	26	86
,,	c	19	3	11	
,,	d	3	3	3	
England, N.E.	a	45	65	55	
,,	b	39	29	34	89
,,	c	16	6	11	
,,	d	0	0	0	
England, E.	a	49	81	65	
,,	b	29	13	21	86
,,	c	16	6	11	
,,	d	6	0	3	
Midland Counties	a	35	81	58	
,,	b	39	16	28	86
,,	c	23	3	13	
,,	d	3	0	1	
England, S.	a	42	74	58	
,,	b	36	16	26	84
,,	c	19	10	15	
,,	d	3	0	1	
Scotland, W.	a	52	71	62	
,,	b	35	23	29	91
,,	c	10	3	6	
,,	d	3	3	3	
England, N.W.	a	52	74	63	
,,	b	23	16	20	83
,,	c	19	10	14	
,,	d	6	0	3	
England, S.W.	a	49	65	57	
,,	b	32	26	29	86
,,	c	6	6	6	
,,	d	13	3	8	
Ireland, N.	a	48	58	53	
,,	b	39	32	36	89
,,	c	13	7	10	
,,	d	0	3	1	
Ireland, S.	a	36	48	42	
,,	b	26	42	34	76
,,	c	32	10	21	
,,	d	6	0	3	
Summary					
British Islands	a	46	69	58	
,,	b	33	23	28	86
,,	c	17	7	12	
,,	d	4	1	2	

1181. *Storm Warnings* :—

Signals hoisted on 9 days; total number of districts warned, 58.

In 30 districts the warnings were justified by subsequent gales (force 8 and upwards) and in 12 districts by subsequent strong winds (force 7 or 6). In 16 districts they were not required.

Gales experienced for which no Warnings were issued.—None.

1182. *Accounts.*—(i) Submitted—a comparison of the receipts and expenditure for the six months ended September 30th for the years 1903–1904.

—— (ii) Read—correspondence with the observer at Birr respecting the bonus for the year 1904. The payment of the bonus, after warning, was authorised.

—— (iii) The payment of an additional sum of £15 to the petty cash account was authorised.

—— (iv) Submitted—The following statement :—

	£	s.	d.
Cash balance on 11th January	5,630	1	2
Receipts from 12th to 24th January	100	0	5
	5,730	1	7
Cheques drawn from 12th to 24th January	336	12	6
Cash balance on 24th January	£5,393	9	1

1183. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 8th February*, 1905.

PRESENT :

PROFESSOR DARWIN, IN THE CHAIR.

CAPTAIN FIELD, *Hydrographer.* | MR. SHAW (*Secretary*).

1184. The Minutes (1168-1183) of the last meeting (25th January) were read and confirmed.

1185. *Barometric Readings: Reduction to Sea Level* (Minute 1174).—It was agreed that the Instructions for the use of Instruments be revised as soon as possible, and that the question of the revision of the tables given in the appendices be considered in connexion with the re-publication.

1186. *Royal Society.*—The correspondence referred to in Minute 1169 was further considered, and it was resolved to inform the Royal Society that, as regards the control of the operations of the Office, the Council adhered to the opinion expressed in the memorandum of 19th October (Minute 1069).

1187. *Wireless Telegraphic Reports from the Atlantic* (Minutes 1150, 1176).—Read —The following letter :—

M.O. 235.

Marconi's Wireless Telegraph Company, Ltd.,
18, Finch Lane, London, E.C.,
26th January, 1905.

SIR,

I HAVE the honour to acknowledge the receipt of your letter of 25th January.

My Company will have pleasure in entering into the arrangement proposed, on the terms that the Meteorological Office pays for all the messages transmitted at our current rates, which at present are sixpence per word exclusive of the land charges, which, as you are of course aware, are a halfpenny a word for the telegraph system of the United Kingdom.

The co-operation of the owners of the ships fitted with the apparatus is not required, except so far as the compilation of the information required is concerned. The apparatus on the ships belongs to our Company, and is worked by operators in our employment, and we are free to transmit such news as we think fit. Weather reports are, however, of course more conveniently compiled by an experienced officer on the ship.

I think we can arrange with the Captains to compile the weather reports in the same fashion as they are compiled for us for the service of the "Daily Telegraph."

I have, &c.,
H. CUTHBERT HALL.
Managing Director.

The Secretary,
Meteorological Office.

The Secretary reported that he had reason to believe that the meteorological reports at present transmitted from Atlantic liners included uncorrected readings of pressure, occasionally with serious instrumental errors, and compass wind directions.

It was agreed to defer any action in the direction of concluding an arrangement with the Marconi Company until satisfactory arrangements could be made with regard to instrumental errors. (*See* Minute 1176.)

1188. *Secretary's Assistant.*—Read—A letter from Professor Schuster asking that Mr. G. Simpson, B.Sc., who had spent a year making observations beyond the Arctic Circle on the West Coast of Norway in connexion with a research upon Atmospheric Electricity, and was to take up in October the duties of lecturer on meteorology in the Victoria University of Manchester, might work in the Office from 1st March as volunteer assistant to the Secretary.

Approved.

1189. *Magnetic Observations at Valencia* (Minute 514).—The continuation of the observations for the current six months was approved.

1190. *St. Helena Anemograph* (Minute 1026).—Read—M.O. 307 from the Crown Agents covering a letter from the Colonial Secretary, St. Helena, to the Crown Agents on the subject of the payment of Mr. Hands' salary during the removal of the anemometer for repairs.

A draft letter to the Colonial Office on the subject was approved. (P.C. 487).

1191. *Daily Weather Reports for Coast Guard Stations* (Minute 1130).—Read—M.O. 262 from the Naval Reserves covering a letter from Inspecting Commander A. E. Tizard, of Bognor, submitting that he should receive the Forecast by the earliest post after issue.

The Secretary was authorised to post the Daily Weather Report to the Bognor Station at 2.30 p.m. at the General Post Office until further order, having ascertained that that post is delivered at Bognor at 7.20 p.m. by the same delivery as a copy of the "General Inference and Forecasts," posted at the S.W. district office at 11.15 a.m., and to inform the Admiral Superintendent.

1192. *Telegraphic Reporting Stations* (Minute 1136).—The Secretary reported a preliminary draft of a revised scheme for observations at Coast Guard stations which would be available for the purposes of telegraphic reports or of second order reports, so arranged as to facilitate the study of questions relating to humidity.

It was agreed to refer it to the Hydrographer for the purposes of inquiry.

1193. *Telegraphic Reporting Stations: Stornoway* (Minute 1171).—The Secretary reported that the evening telegrams from Stornoway had been discontinued by Mr. MacKenzie at the close of January—M.O. 274—and that he had arranged with the "Daily Telegraph" to reopen the correspondence in order to get the matter put upon a satisfactory basis.

1194. *Royal Meteorological Society: Exhibition of Instruments.*—The Secretary was authorised to lend instruments for exhibition from 14th to 17th March.

1195. *Publications: Presentation Copies.*—Read—M.O. 254 from Professor Cleveland Abbe asking for "the Abbe Meteorological Library, Johns Hopkins' University, to be put on the list for all the publications of the Meteorological Office, and any of the odd duplicates of other publications that you may wish to dispose of."

The Secretary was directed to make further inquiry.

1196. *Admiralty Instruments.*—Submitted—The following:—

M.O. 261.

Admiralty, S.W.
28th January, 1905.

SIR,

I BEG to inform you that the stock of aneroids to be maintained at Malta is to be increased to 40, and to request that the establishment may be completed to this number as soon as possible.

I am, &c.,
A. MOSTYN FIELD,
Hydrographer.

The Secretary,
Meteorological Office.

Approved.

1197. *Logs.*—Nineteen received, three excellent, Captain W. Colbeck, Captain J. A. Sutcliffe, Captain A. Simpson; also one "excellent" short log.

The presentation of Parts 3 and 4 of O. 71 (synchronous charts of the North Atlantic) to Captain W. Colbeck of the Antarctic Relief Ship *Morning* was authorised. (See Minute 911).

1198. *Storm Warnings:*—

Signals hoisted on 4 days; total number of districts warned, 37.

In 16 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 12 districts by subsequent strong winds (force 7 or 6). In 9 districts they were not required.

Gales experienced for which no warnings were issued.—None.

1199. *Accounts* (i).—The payment of a fee of £1 5*s.* to the Dundee Agent in respect of the seven months' register of observations at the Whaling Station in Repulse Bay, Davis Strait, lat. 66° 30′ N., long. 86° 20′ W., by Captain John Murray, of the whaler *Active*.

—— (ii).—With regard to Minute 692 (2) it was decided that the increase of monthly payment in the Telegraph Branch in lieu of allowance on account of exceptional hours is not payable during sick leave.

—— (iii).—Submitted—The fortnightly statement:—

	£	*s.*	*d.*
Cash balance on 24th January	5,393	9	1
Receipts from 25th January to 7th February ...	84	6	8
	5,477	15	9
Cheques drawn from 25th January to 7th February...	1,048	12	3
Cash balance on 7th February	4,429	3	6

1200. *Reports of Work* for January were submitted and approved.

1201. *Library.*—A list of publications received since last meeting was laid on the table.

63, *Victoria Street, S.W., 22nd February*, 1905.

PRESENT :

PROFESSOR DARWIN. | MR. SHAW, *Secretary*.

In the absence of a quorum of Directors the following items (Minutes 1202–1215) were provisionally dealt with.

1202. The Minutes, 1184 to 1201, of the last meeting, 8th February, were read.

1203. *Meteorology of the Colonies and Dependencies.*—The Secretary read a memorandum (M.O. 489), prepared for a committee of the Council of the British Association on co-operation with the Colonies and Dependencies in Meteorological investigation.

It was agreed that the Council are desirious of co-operating with the British Association in bringing to the notice of His Majesty's Government the desirability of establishing effective means of co-ordinating meteorological observations made in British Dominions beyond the seas.

1204. *Kite Observations.*—Read—M.O. 439 from Mr. F. G. Paynter, engineer and assistant, since May 1903, to Dr. Barton in connexion with his airship at the Alexandra Palace, offering to undertake kite observations on the Farne Islands near Berwick, which are in the occupation of his father, in return for a small salary, in addition to the cost of the apparatus and working expenses.

The Secretary was directed to reply that the Council had no funds available for the purpose.

1205. *Publications, Presentation Copies: Cuba* (M.O. 412).—The presentation of the monthly report, the Second Order volume and the Hourly Readings for one station, in exchange for the monthly *Boletin* of the Havanna Station of the department of Agriculture, Industry and Commerce of the Republic of Cuba was approved.

1206. *Storm Warnings.*—Read—M.O. 455 from the Admiralty enclosing a copy of a letter from Rear Admiral Angus Macleod, Commanding the Coast of Ireland, respecting the inutility of directing from London, the hoisting of the storm cone for Queenstown Harbour.

It was resolved that arrangements be made for the return to the office, month by month, of the storm warning telegrams, endorsed with the time at which the cone was hoisted after receipt of the warning.

The Secretary was directed to inform the Admiralty that special inquiry would be made with respect to the storm signal service at Queenstown, and the result communicated to the Admiralty in due course.

1207. *Storm Signal Stations: Gorleston* (Minute 1160).—Read—M.O. 397 from the Board of Trade, supporting the request of the Harbour Master, at Gorleston.

It was agreed to duplicate the Yarmouth warnings for Gorleston, and in case the distance is too far for duplication, to transfer the warning station from Yarmouth to Gorleston.

1208. *Daily Weather Reports: Coast Guard Stations* (Minute 1191).—Reported—That at the request of the Admiral Superintendent, an advance typewritten copy of the forecasts was being handed in at the Naval Reserves Office for Bognor, instead of the Daily Report.

Approved.

—— *Lower Largo*.—An application (M.O. 398) from Mr. P. B. Proudfoot, Tobacconist, &c., of Lower Largo, for a free copy of the Daily Weather Report for exhibition in his shop was declined after consideration of a report of the Fishery Board for Scotland upon the application (M.O. 479).

1209. *Forecasts.*—Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of January, 1905 :—

The letters used have the following signification :—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	55	65	60	86
,,	b	26	26	26	
,,	c	19	6	13	
,,	d	0	3	1	
Scotland, E.	a	45	68	57	84
,,	b	36	19	27	
,,	c	19	13	16	
,,	d	0	0	0	
England, N.E.	a	62	65	64	96
,,	b	32	32	32	
,,	c	3	3	3	
,,	d	3	0	1	
England, E.	a	52	74	63	91
,,	b	32	23	28	
,,	c	16	3	9	
,,	d	0	0	0	
Midland Counties	a	39	74	57	86
,,	b	32	26	29	
,,	c	29	0	14	
,,	d	0	0	0	
England, S.	a	71	71	71	94
,,	b	23	23	23	
,,	c	3	3	3	
,,	d	3	3	3	
Scotland, W.	a	58	68	63	94
,,	b	29	32	31	
,,	c	10	0	5	
,,	d	3	0	1	
England, N.W.	a	32	55	44	89
,,	b	52	39	45	
,,	c	16	6	11	
,,	d	0	0	0	
England, S.W.	a	45	49	47	89
,,	b	36	48	42	
,,	c	19	3	11	
,,	d	0	0	0	
Ireland, N.	a	55	55	55	86
,,	b	36	39	38	
,,	c	6	3	4	
,,	d	3	3	3	
Ireland, S.	a	52	71	62	94
,,	b	35	29	32	
,,	c	13	0	6	
	d	0	0	0	
Summary.					
British Islands	a	51	65	58	90
,,	b	34	30	32	
,,	c	14	4	9	
	d	1	1	1	

1210. *Fishery Barometer: Lemreway, Lewis.*—Read—M.O. 415 from the Fishery Board for Scotland, asking for a Fishery Barometer for Lemreway, Lewis.

The Secretary was directed to make inquiry of the Fishery Board in the same sense as the letter addressed to Sir T. H. Elliott (Minute 1119), and to say that the consideration of the application from Lemreway would be postponed pending arrangements for the regular supervision of the fishery barometer stations.

1211. *Logs.*—Seven received, none excellent; two lighthouse registers, one short log.

1212. *Storm Warnings:*—

Signals hoisted on 1 day; total number of districts warned, 14.
In 7 districts the warnings were justified by subsequent gales (force 8 and upwards) and in 7 districts by subsequent strong winds (force 7 or 6).

Gales experienced for which no warnings were issued.—None.

1213. *Paper on the Seasons in the British Isles* (Minute 1157).—The Secretary reported that the cost of overtime work upon the preparation of the tables for the paper was £31 15*s.* (M.O. 491), and requested authority for the payment of the amount.

Approved.

1214. *Accounts:* (i.) *Subpœnas.*—In the case of payments of conduct money upon subpœnas by both parties in an action on a representation made by Messrs. Braunstein & Skelton (M.O. 426), it was resolved that the Council's charges will be satisfied by the payment of £2 2*s.* per day of attendance, and the conduct monies received may be set against the charges if the two parties agree thereto.

—— (ii.)—*Hollesley Bay.*—The Secretary reported that he had arranged to take back instruments supplied to the Colonial College, Hollesley Bay, at a valuation price of £5 16*s.* 8*d.*, which after deducting the amount due from the College, £4 19*s.* 8*d.*, left a balance due to the College of 17*s.*

The payment of the 17*s.* was authorised.

—— (iii.)—Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 7th February	4,429	3	6
Receipts from 8th to 21st February	128	0	0
	4,557	3	6
Cheques drawn from 8th to 21st February	591	9	6
Cash balance on 21st February	£3,965	14	0

1215. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 8th March*, 1905.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN.	Captain FIELD, *Hydrographer.*
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

1216. The Minutes (1184–1215) of the meetings of 8th February and 22nd February were read and confirmed.

1217. *Administration of the Office* (Minutes 1069, 1169, 1186).—Read—M.O. 748 from the Royal Society, enclosing a copy of a letter from the Royal Society to the Treasury conveying the assent of the Society to the transfer of the control of the Office to the body appointed by the Treasury on 1st April, 1905, or as soon thereafter as might be convenient.

Resolved—That the Royal Society be informed that the Council await the instructions of H.M. Treasury upon the matter.

1218. *Anemograph Stations: Alnwick* (Minute 1117).—Read—M.O. 615 from Mr. R. Kyle, Agent to the Duke of Northumberland, asking for an inspector to visit Alnwick and report upon the Duke's Schools at Alnwick as a site for a Dines-Baxendell apparatus for recording the direction and velocity of the wind.

It was resolved that, in compliance with the request, Mr. R. Curtis be sent to report upon the site.

—— —— *Roche's Point.*—Read—M.O. 616 from Mr. M. Fitzmahony, Observer at Roche's Point, announcing the erection of an anemometer, in charge of the Chief Officer of the Coast Guard at that station, by the Queenstown Harbour Board.

The Secretary was authorised to arrange for the records to be sent to the Office if the Harbour Board are willing to send them.

1219. *Forecast Districts Inquiry* (Minute 1008).—The Secretary was authorised to pay for the blocks of the reproductions of the diagrams illustrating the paper read before the Scottish Meteorological Society on 6th December, and to arrange for the supply of 200 copies of the paper for the use of the Office.

1220. *Instruments: Apparatus for Testing the Adjustments of Sunshine Recorders.*—The Secretary submitted a design of an apparatus for testing the adjustments of sunshine recorders, prepared by Mr. G. Simpson at his suggestion, and was authorised to have a working model of the apparatus made at a cost estimated not to exceed £4.

1221. —— Authority was given for complying with a request of Mr. J. Baxendell (M.O. 614) for the loan of a sunshine recorder to compare with the one now in use at Southport, and supposed to be affected by the discoloration of the ball.

1222. —— *Admiralty.*—In reply to requests for instructions from the Naval Storekeeper at Hong Kong (M.O. 504) with regard to certain barometers and hydrometers that had been in store at the station for many years, it was agreed that the Store Keeper be instructed to sell them unless the Hydrographer should advise otherwise.

1223. *Publications: Presentation Copies.*—The presentation of a year's issue of Pilot Charts to the Department of Marine and Fisheries, Tidal and Current Survey, Ottawa, was approved (M.O. 459).

It was resolved that publications hitherto sent to the Officina Central Meteorológica, Santiago, Chile, be sent in future to the section of meteorology under the direction of the Administration of Maritime Territory, Valparaiso (M.O. 551), with the request that the publications be distributed among the three institutions mentioned in the letter (M.O. 551) in such manner as the Administration may think fit.

1224. *Forecasts*—Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of February, 1905.

The letters used have the following signification :—

a = complete success. | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	50	57	54	91
,,	b	39	36	37	
,,	c	11	7	9	
,,	d	0	0	0	
Scotland, E.	a	36	68	52	81
,,	b	36	21	29	
,,	c	21	7	14	
,,	d	7	4	5	
England, N.E.	a	71	72	72	95
,,	b	25	21	23	
,,	c	4	7	5	
,,	d	0	0	0	
England, E.	a	50	57	54	93
,,	b	39	39	39	
,,	c	11	4	7	
,,	d	0	0	0	
Midland Counties	a	57	61	59	86
,,	b	14	39	27	
,,	c	29	0	14	
,,	d	0	0	0	
England, S.	a	68	57	63	93
,,	b	21	39	30	
,,	c	11	4	7	
,,	d	0	0	0	
Scotland, W.	a	50	64	57	89
,,	b	32	32	32	
,,	c	14	4	9	
,,	d	4	0	2	
England, N.W.	a	64	64	64	91
,,	b	22	32	27	
,,	c	14	4	9	
,,	d	0	0	0	
England, S.W.	a	43	50	47	89
,,	b	39	46	42	
,,	c	18	4	11	
,,	d	0	0	0	
Ireland, N.	a	43	79	61	85
,,	b	29	18	24	
,,	c	25	3	14	
,,	d	3	0	1	
Ireland, S.	a	32	68	50	84
,,	b	39	29	34	
,,	c	29	3	16	
,,	d	0	0	0	
SUMMARY.					
British Islands	a	51	63	57	89
,,	b	31	32	32	
,,	c	17	4	10	
,,	d	1	1	1	

1225. *Accounts.*—Submitted—The following Statement of Accounts for the nine months ending 31st December, 1904 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1903–1904	—	1,489 12 7	Administration :		
Proportion of vote ...	—	10,500 0 0	Secretary	450 0 0	
Repayment of expenses charged under—			Salaries and wages ...	819 11 6	
(1.) Incidental expenses	19 19 11		Rent, fuel, and lighting	530 16 11	
(2.) Observatories ...	34 4 10		Incidental and contingent expenses ...	323 6 0*	
(3.) Special researches	29 5 0		Furniture, fittings, &c.	127 10 4	
		83 9 9	Expenses incidental to International Meteorological Congress...	29 0 8	
					2,280 5 5
Supply of Information :			Special Researches :		
Weather Forecasts, Reports, &c. ...	359 16 10		Salaries and other charges	—	635 0 4
Telegrams sent abroad	450 11 2		Land Meteorology :		
		810 8 0	Observatories and stations, including remuneration of observers	1,702 5 10	
			Salaries :— Discussion and reduction of observations, &c. ...	1,384 9 1	
					3,086 14 11
Supply of Instruments, &c. :			Weather Information and Forecasts :		
Repayment of cost of M.O. instruments purchased by observers	120 13 6		Telegraphic reports and storm warnings, remuneration of observers, &c.	1,701 15 4	
Repayment of cost of other commissions...	271 6 10		Salaries:—Preparation and issue of reports and forecasts ...	1,101 2 1	
		392 0 4			2,802 17 5
			Inspections :		
Charges for Commission :			Salaries and travelling expenses	—	282 2 6
On supply of instruments, &c.	—	17 9 6	Ocean Meteorology :		
			Salaries :— Discussion and reduction of observations... ...	1,050 11 0	
			Expenses incidental to the supply of instruments :—		
Superannuation Account :			Proportion for care and issue of instruments	127 10 0	
Annuities	214 1 4		Royal Navy ...	455 12 3	
Interest on Investment	33 10 4		Mercantile Marine and Stations ...	476 0 4*	
		247 11 8			2,109 13 7
			Antarctic Meteorology :		
			Salaries and other charges	—	37 6 4
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c.	—	131 4 4
			Superannuation :		
			Pensions and allowances...	621 18 2	
			Invested	750 0 0	
					1,371 18 2
			Balance :		
			Cash at Bank... ...	754 12 11	
			„ at Office ...	48 15 11	
					803 8 10
		£13,540 11 10			£13,540 11 10

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors (partly estimated)	1,488 6 4	By cash at Bank and at Office ...	803 8 10
„ balance	631 10 6	„ H.M. Exchequer	975 0 0
		„ sundry debtors	341 8 0
	£2,119 16 10		£2,119 16 10

Note.—On December 31st the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £2,156 4*s.* 1*d.*

1226. *Logs.*—Thirteen received, one excellent (Captain G. S. Webster) ; one light-house register.

1227. *Storm Signal Stations : Courtown.*—Reported—That the supply of storm warnings to Courtown, County Wexford, had been discontinued, as they were deemed unnecessary by the local committee (M.O. 541).

1228. *Storm Warnings :—*

Signals hoisted on 6 days ; total number of districts warned 36.

In 14 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 11 districts by subsequent strong winds (force 7 or 6). In 11 districts they were not required.

1229. *Accounts :* (i.) *Audit.*—Reported—That the cash accounts for the quarter ended the 30th September last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st July last, when there was a balance of £991 17*s.* 9*d.*, were £3,777 7*s.* 1*d.* against £4,011 4*s.* 2*d.* in the corresponding period of the preceding financial year. The payments were £3,384 18*s.* 8*d.* against £3,816 10*s.* 2*d.* during the same period in the previous year. The balance in hand and at the bank on the 30th September, amounted to £1,384 6*s.* 2*d.*, and at the same date in 1903 to £1,960 12*s.* 9*d.*

—— (ii.) Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 21st February	3,965	14	0
Receipts from 22nd February–7th March	59	1	1
	4,024	15	1
Cheques drawn from 22nd February–7th March ...	773	12	8
Cash balance on 7th March	£3,251	2	5

—— (iii.) *Special Reports for Newspapers.*—It was resolved that the charge for a special evening report of observations at Valencia, as requested by the London editor of "Le Matin," be 1*s.* per day.

1230. *Reports of Work* for February were submitted and approved.

1231. *Library.*—A list of publications received since last meeting was laid on the table.

63, *Victoria Street, S.W., 22nd March*, 1905.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN.	CAPTAIN FIELD, *Hydrographer.*
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

1232. The minutes (1216–1231) of the last meeting, 8th March, were read and confirmed.

1233. *Administration of the Office.*—It was resolved that the correspondence relating to Minutes 1043, 1069, 1169, 1186, and 1217 be printed as follows :—

I.

Letter from H.M. Treasury to the Royal Society dated September 3rd, 1904, communicated by the Secretary of the Royal Society with an intimation that the President would bring before the Council of the Royal Society any representation that the Meteorological Council might wish to make upon the subject.

15116/04.

Treasury Chambers,
September 3rd, 1904.

SIR,

THE Lords Commissioners of His Majesty's Treasury have had before them the Report of the Committee appointed under the chairmanship of the Right Hon. Sir Herbert Maxwell, Bart., M.P., by Treasury minute of December 9th, 1902, with instructions to inquire and report as to the administration by the Meteorological Council of the existing Parliamentary Grant, and as to whether any changes in its apportionment are desirable in the interest of meteorological science, and to make any further recommendations which may occur to them with a view to increasing the utility of the grant."

The recommendations of the Committee are contained in paragraphs 35–37 and 59–69 of the Report, which has been presented to Parliament (Cd. 2123), and copies of which are enclosed herewith.

The principal recommendations may be summarised as follows :—

(1) The Meteorological Council (which is now registered as a limited company under the Joint Stock Companies Acts, with license to dispense with the word "limited") should be wound up and reconstituted as a branch of the Board of Agriculture and Fisheries, with a paid Director at its head, assisted by an unpaid Advisory Board.

(2) The Director shall have a scientific assistant, and a slightly increased staff, with better premises.

(3) The Post Office should provide better telegraphic facilities, and should make no charge for its services.

(4) The cost of supplying meteorological instruments to the Royal Navy (now defrayed out of the grant) should be charged to Navy Votes.

(5) While not surprised that the Meteorological Council should, in the present state of its finances, have decided to withdraw the grant to the Ben Nevis Observatories, the Committee think that "every effort should be made to provide the £350 required for the purpose."

Their Lordships have given very full consideration to the Committee's Report, and I am now to convey to you the conclusions at which they have arrived :

(1) My Lords have not felt able to accept the recommendation that the office should be reconstituted as a branch of the Board of Agriculture and Fisheries.

Apart from any question of the special suitability of the Board of Agriculture and Fisheries to exercise control over meteorological investigation, My Lords consider that the best organisation to carry out such work as that hitherto performed by the Meteorological Council is a Committee or Council, with full discretion to administer the funds entrusted to them by Government in the manner which they consider most to the interest of meteorological science and the requirements of the public. Their Lordships have deemed themselves in the past very fortunate in being able to rely, in dealing with scientific questions, upon the aid of the Royal Society, which commands the confidence not only of the scientific world but also of Parliament ; and they hope, therefore, that the present system of management by a committee appointed by and reporting to the Royal Society, assisted by a grant in aid out of the Vote for Scientific Investigation, will be continued.

Such an arrangement would not preclude the adoption of the recommendations of the Committee on the subject of the constitution of the Council. My Lords have no objection to the suggestion that representatives of the Board of Trade, and of the Board of Agriculture and Fisheries should, like the Hydrographer to the Admiralty, be *ex officio* Members of the Council. They are further disposed to concur in the suggestion that the functions of the re-constituted Council should be advisory rather than administrative, the latter functions being entrusted to the Director. If this course be adopted, it will probably be found possible to relieve the Council of much of the work which it now performs, and to reduce the number of its meetings to three or four in the year.

(2) As regards improved accommodation and increased staff, the recommendations of the Committee appear to My Lords to be reasonable; but it will be for the Director to consider what staff he can afford to maintain out of the funds at his disposal.

(3) My Lords see no sufficient reason for calling upon the Post Office to surrender £2,000 of Revenue, or for imposing an increased charge on Post Office votes for improved services; but they will, if the Council desire it, consult the Postmaster-General as to any increased facilities for communication which can properly be granted.

(4) My Lords agree that if the Board of Admiralty wish the supply of meteorological instruments to ships of the Royal Navy to be continued, the cost should fall upon Navy votes; and they are communicating with the Admiralty in this sense.

(5) My Lords have carefully considered the difficult question relating to the proposed withdrawal by the Meteorological Council of the grant in respect of Fort William Observatory, and they observe that Sir H. Maxwell and Sir William Abney, while agreeing with the majority of the Committee that it would be a bad bargain economically to allow the observatories to disappear, consider that it would be unfair to the Meteorological Council to lay upon them the burden of contributing £350 a year to an establishment which they have not found to have been of distinct service to their work.

My Lords agree in this view, and they accordingly propose that the Council should be relieved of liability for the grants of £100 and £250 hitherto contributed by them in respect of the observatories at Ben Nevis and Fort William. They hope, however, to secure the objects which the majority of the Committee had in view by placing an equivalent sum (£350 a year) at the disposal of the Scottish Meteorological Society for the maintenance of the observatories. Such a grant would be subject to the condition that the observatories supplied the Meteorological Council, without payment, with such information as they may reasonably require.

My Lords trust that an arrangement on the above lines would remove the difficulties which have existed with regard to these observatories.

The financial position of the re-constituted Meteorological Council would be that, while in receipt of the same grant in aid as heretofore, viz., £15,300, it would be relieved of payments as follows:—

(1) £350 per annum in respect of the Ben Nevis and Fort William Observatories.

(2) About £500 per annum in respect of the supply of meteorological instruments to the Royal Navy.

(3) Any savings which might be effected in the payments now made to the Members of the Council, if it should be found possible to reconstitute the Council on the lines recommended by Sir Herbert Maxwell's Committee.

My Lords believe that the savings above mentioned would be sufficient to allow of the suggested increase to the establishment of the Office—scientific and clerical—and of the provision of improved accommodation. They would be glad to learn that they may rely upon the co-operation of the Royal Society in carrying out the above proposals.

I am, Sir,
Your obedient Servant,
VICTOR CAVENDISH.

The President of the Royal Society,
Burlington House, W.

II.

Communicated to the Royal Society, October 19th, 1904. Minutes 1069 to 1904.

MEMORANDUM ON THE LETTER OF 3RD SEPTEMBER, 1904, FROM THE SECRETARY OF THE TREASURY TO THE PRESIDENT OF THE ROYAL SOCIETY.

October 16th, 1904.

In compliance with what they understand to be the wish of the Royal Society, the Meteorological Council have endeavoured in the accompanying Memorandum to express concisely the opinions they have formed on the experience of the working of the system under which the business of the Meteorological Office has been conducted since the constitution of the Council in 1876.

1. We concur in the conclusion stated in the Treasury letter (of September 3rd, 1904), which is in effect to retain the existing general system, "That the best organisation to carry out such work as that heretofore performed by the Meteorological Council is a Committee or Council, with full discretion to administer the funds entrusted to them by Government in the manner which they consider most

to the interest of Meteorological science and the requirements of the public." Also "that the present system of management by a Committee appointed by and reporting to the Royal Society, assisted by a grant in aid out of the Vote for Scientific Investigation," should be continued.

2. We also concur in the view expressed in that letter "that the functions of the re-constituted Council should be advisory rather than administrative, the latter functions being entrusted to the Director." The Director would take the place of Chairman of the new consultative and advisory body, which might conveniently retain the name of Meteorological Council.

3. We suggest that the Council should include, with the Director, not less than three representatives of the Royal Society, and as heretofore the Hydrographer of the Admiralty.

4. The connection of the Hydrographer with the Meteorological Council has subsisted from the outset, and its value and necessity cannot be questioned. Nor can it be doubted that in the future further opportunities will arise in which the co-operation of the Admiralty will be of material service in aiding the operations of the Meteorological Office.

5. A close relation exists between the practical aspects of the subjects dealt with by the Meteorological Office and those the supervision of which is vested in the Board of Agriculture and Fisheries. With the co-operation of the Board of Agriculture, there is reason to anticipate that improved means might be found for the dissemination of information as to temperature, rainfall, and other climatic conditions, with which agricultural success is so closely associated, as well as for collecting the data, the presentation of which in a practical shape to the community it is desirable to facilitate and extend.

6. The supply of barometers, and information as to weather to the fishing population which has been undertaken by the Meteorological Office might, no doubt, be guided and supplemented with much advantage by aid of the Fishery Board.

7. The continued experience of the Office shows that in many directions the co operation of the Officers of the Board of Trade in connection with the collection of information valuable for mariners and its distribution could be beneficially applied.

8. Speaking generally, there can be little doubt that a more systematic co-operation between these departments in directions such as those above indicated, and doubtless in many others, would greatly tend to the more satisfactory application in a practical shape of the information which it is the function of the Meteorological Council to collect.

9. Although, therefore, we recognise that the presence of representatives of the Board of Agriculture and Board of Trade on the Council might, in connection with the subjects with which they were concerned, be of much value, these would form but a small portion of the matters commonly brought before the Council, and it might therefore be more convenient that those representatives should not be expected to attend the meetings unless specially invited to consider subjects in which their departments were interested. In this respect the Hydrographer's position is materially different, and his presence would always be desirable.

10. Of a Council thus constituted, the Director and the representatives of the Royal Society would be nominated by the President and Council of the Royal Society, under such conditions as to period of service and remuneration as were thought suitable, and they should be subject to removal by the same authority.

11. We consider that the general scope of the operations of the Meteorological Office should be settled from time to time, on the initiative of the Director and the Council, and would be indicated by the apportionment of the Parliamentary Grant in the Annual Estimate. This should be brought before the President and Council of the Royal Society for consideration, and when approved would be forwarded, as customary, to the Treasury. The submission of the Annual Estimate should be accompanied by the Report of the previous year's proceedings, which is eventually presented to Parliament.

12. The entire responsibility for the management of the Meteorological Office, and the administration of the Parliamentary grant, with free discretion in initiating proposals, should rest with the Director, it being understood that important changes of organisation in the office or methods of working, of importance or involving additional expenditure not provided for in the annual estimate should be brought before the Council for its approval. Within the amounts sanctioned, either on the general year's estimate, or by a special resolution of the Council, the Director would be authorised to incur expenditure.

13. The Director would conduct all correspondence relating to the business of the Meteorological Office.

14. To ensure financial regularity, one of the Members of the Council should be charged with the duty of countersigning cheques drawn by the Directors to meet the current expenditure, having first satisfied himself that the amount has been duly sanctioned.

15. The meetings of the Council would be arranged by the Director in consultation with the Council.

16. The Director should bring before the Council at its several meetings such matters as it might be expedient to record on the proceedings of the Council, or to submit for their consideration, and resolutions of the Council on matters brought before it should be regularly recorded and printed, and copies sent to each of its members, and the Royal Society.

17. We are of opinion that having in view the nature of the subjects to be dealt with by the Director, he will be more satisfactorily and efficiently supported by a relatively small Council, meeting at such intervals as will enable them to follow up needful discussion and consideration of subjects brought before them by the Director, than by a more numerous body meeting at more distant intervals, and that in such a body, so acting, their sense of responsibility for the duty entrusted to them will also be more fully maintained. For like reasons we think that some moderate but sufficient remuneration should be assigned to Members of the Council.

18. We regret that we are unable to regard the relief proposed by the Treasury to be given in respect of £500 for instruments supplied to the Navy, and £350 in respect of the Observatories at Ben Nevis and Fort William, and of possible savings in the payments to the Council, as being likely to allow of the increased expenditure which we have thought to be essential for meeting in a satisfactory manner the legitimate requirements of the Office, which is charged with the administration of the Meteorological service of Great Britain, and the international obligations placed on it, which we continue to think cannot be properly done at a smaller cost than that stated in the Memorandum presented to Sir H. Maxwell's Committee.

19. We further continue to hope, that, although it is not thought expedient to change the established system which requires payments to be made for all telegraphic services rendered by the Post Office, it may yet be possible to find means for increasing the facilities for the prompt transmission of Meteorological messages which are not only important for our own service, but possibly even more so for the Meteorological services of the whole of Europe, which are greatly dependent on the early transmission of the results of observations made on the coasts of Britain.

20. It may be added that although the existing constitution of the Meteorological Council, under the "Companies Acts," might be objected to as unsuitable, yet it has advantages which it would be difficult to secure under any other system that could be readily applied to it. The power of dealing with the funds at the disposal of the Council in a legal manner could not be given otherwise than by an Act of Parliament or a Charter. We therefore have no suggestions to offer on this subject.

III.

Reply of Royal Society to H.M. Treasury.

SIR, November 8, 1904.

Your letter (15116/04), dated September 3, enclosing the report of Sir Herbert Maxwell's Departmental Committee on the administration of the Meteorological Office, and containing the proposals of the Lords of H.M. Treasury founded thereon, has received the prolonged and very careful attention of the President and Council of the Royal Society. The Council have also taken pains to obtain the advice of those fellows of the Society who are specially cognisant of Meteorological Science.

In reply to your letter, we are instructed to transmit to you the views of the President and Council with regard to the further co-operation of the Royal Society in carrying on the Meteorological Service of the United Kingdom.

The Royal Society are prepared at all times, to the best of their ability, to place their corporate services at the disposal of H.M. Government. The only question that can arise is as to whether the work required of them lies within their province. They are accordingly willing to accept the proposal of My Lords that they should continue to be responsible for the Meteorological Service, if the conditions involved are such as they can fulfil; although they still adhere to their previously expressed opinion, which is also the opinion of Their Lordships' Committee, that for the efficient conduct of the administration of Weather Reports and Storm-warnings, the facilities possessed by a Government Department are essential.

But they desire to make the reservation that the acceptance of responsibility on their part for the expenditure of the annual grant must involve a much closer control than could be secured by a merely advisory committee meeting a few times a year. The members of a properly effective Committee have a difficult and onerous task imposed on them, which they cannot be asked to undertake without remuneration. The sum originally assigned for the remuneration of the Meteorological Council, which has since been reduced from financial necessity, does not appear to be, on the whole, out of proportion to the great improvements in the service that have accrued from their investigations and supervision.

In the report of Their Lordships' Committee, no item of expenditure is indicated wherein a saving could reasonably be made by curtailment of the service. The Committee even express the definite opinion (Report 41) that "it would be better to circumscribe the operations of the Council to routine rather than to expect them to undertake investigation for which they have not adequate means."

The saving of £350 a year involved in the withdrawal of the grants to the Observatories of Fort William and Ben Nevis, and the saving of £500 on instruments supplied to the Navy, amount together to little more than the increased expenditure arising from the recent pension scheme.

The President and Council are emphatically advised, and have come to the conclusion, that the savings suggested by My Lords would not admit of the "increase in the establishment of the office, scientific and clerical, and the provision of increased accommodation," which are recommended in the Report of the Committee. They therefore regret that it is not possible for them, on this basis, to accept the task of providing these improvements, which they are invited by Their Lordships, in the last paragraph of your letter, to assume; nor are they prepared, on their own responsibility, to curtail a public service which has been in operation, as at present, for more than 20 years, in order to provide funds for the new developments.

The proposals of their Lordships might suffice for the administrative requirements of the Office, as it was constituted a quarter of a century ago, together with the recent pension scheme; but nothing would be left for progressive development on the lines of scientific experiment, nor for that co-operation with the international meteorological investigations undertaken by the Governments in other countries, which would naturally be expected of a Council controlled by the Royal Society.

The President and Council observe that the Meteorological Council estimate the present additional requirements for scientific investigation to be at least £2,000 per annum. If an adequate

annual grant were made, to be devoted wholly to such investigation, the Royal Society could see their way to continued responsibility for the service and would be prepared to draw up a scheme of administration for the consideration of H.M. Government.

But unless satisfactory provision can be made for the scientific side of the service, either directly, or in concert with the Government of India, which has expressed its willingness to contribute to such work conducted in England, the Royal Society feel that they cannot consistently or usefully enter into a fresh agreement to be responsible for the Meteorological Service. It would be misleading for them to become responsible for a grant which is almost entirely required for routine public service, and cannot properly be regarded as a "grant in aid for scientific investigation."

We are, Sir,
Your obedient Servants,
J. LARMOR,
ARCHD. GEIKIE,
Secretaries R.S.

The Secretary,
H.M. Treasury.

IV.

Letter from Secretary of the Royal Society enclosing copy of letter from H.M. Treasury to Royal Society, dated 21st January, 1905.

The Royal Society,
Burlington House, London, W.,
January 24th, 1905.

DEAR DR. SHAW,

I AM instructed by the President of the Royal Society to communicate for the information of the Meteorological Council the further reply (enclosed) of H.M. Treasury on the subject of the future organisation of the British Meteorological Service.

The President will be glad to receive and communicate to the Council of the Royal Society such observations as your Council may desire to offer, particularly with regard to the last paragraph of the letter. To this end a copy of the letter from the Royal Society to H.M. Treasury, to which the present communication is in reply, is also enclosed.

I am very faithfully yours,
J. LARMOR,
Secretary R.S.

Dr. W. N. Shaw, F.R.S.,
Secretary Meteorological Council.

Copy.

18914/04.

Treasury Chambers,
January 21st, 1905.

SIR,

I AM directed by the Lords Commissioners of His Majesty's Treasury to state that They have had before Them the letter of the Secretaries of the Royal Society, dated November 8, 1904, relative to the question of the future arrangements to be made for the administration of the Meteorological Office.

I am, in the first place, to convey Their Lordships' thanks to the President and Council for the time and attention which they have been so good as to give to the matter.

My Lords fully appreciate the point of view of the Royal Society and the reasonableness of their stipulation that, if they are to continue to be responsible for the control of the Meteorological Office, the grant must be increased to such an extent as to enable satisfactory provision to be made for the scientific side of the service, including that co-operation with the international meteorological investigations undertaken by the Governments of other countries which would naturally be expected of a council controlled by the Royal Society.

As stated in the letter from this department of September 3, 1904, My Lords were not without hope that the setting free of £350 formerly paid to the Ben Nevis and Fortwilliam Observatories and a sum of about £500 in respect of meteorological instruments supplied to the Royal Navy, together with certain savings upon the payments to the Members of the Meteorological Council, might have rendered it possible to develop the scientific work of the Office to a not inappreciable extent. My Lords gather, however, from the letter of November 8, that this is not practicable, and that in the opinion of the Royal Society an additional grant of at least £2,000 per annum is necessary.

My Lords greatly regret that, in present circumstances, They would not feel justified in asking Parliament to provide such an addition to the existing grant; and They come therefore reluctantly to the conclusion that They are unable to meet the conditions on which alone the Royal Society would be willing to continue to be responsible for the control of the Meteorological Council.

It is only due to the Royal Society, who have so long exercised that control, that My Lords should address to them the first intimation of the decision at which They have arrived with regard to the future management of the service.

The recent Committee recommended that the Meteorological Office should be reconstituted as a department under the control of the Board of Agriculture and Fisheries, the Director being made responsible to that Department for administration, and an Advisory Board being at the same time created, whose functions should be consultative only.

My Lords fully agree in the recommendation of the Committee that the Director should be given a freer hand than a present, and that there should be no necessity for the details of administration being reviewed, as now, by a Council. On the other hand, as explained in the Treasury letter of September 3, My Lords are unable to concur in the proposal that the Meteorological Office should be reconstituted as a branch of a Government Department. Their Lordships intend, therefore, to make the Director more completely responsible for the whole executive and administrative control

of the Office. as recommended by Sir H. Maxwell's Committee, but to associate with him a Committee composed of representatives of the Government Departments which are principally interested in the work of the Office, such as the Admiralty, the Board of Trade, the Board of Agriculture and Fisheries, the Post Office, and the Treasury.

They think that the new arrangement might conveniently come into operation at the beginning of the ensuing financial year, namely, on April 1, next; and They would be glad to learn that this date would be convenient to the Royal Society and the Council as at present constituted.

I am, Sir,
Your obedient Servant,
(Signed) G. H. MURRAY.

See Minutes 1169, 1186.

V.

Letter from the Assistant Secretary of the Royal Society enclosing copy of the reply of the Society to the letter of H.M. Treasury of 21st January.

M.O. 748.

Burlington House,
London, W.
February 28th, 1905.

DEAR SIR,

I AM directed to enclose for the information of the Meteorological Council a copy of the letter which the Royal Society has addressed to H.M. Treasury in reply to Sir George Murray's letter, of which you have already seen a copy, and I am to request you to convey the thanks of the President and Council of the Royal Society to the Meteorological Council for their letter advising the Royal Society on the subject.

I am, &c.,
ROBERT HARRISON,

The Secretary,
Meteorological Council.

Copy.

"February 23rd, 1905.

"SIR,

"WE are directed to acknowledge the receipt of Sir G. H. Murray's letter of January 21, 1905, and to convey the thanks of the President and Council of the Royal Society for the early intimation of the intention of the Lords Commissioners of H.M. Treasury, with regard to the future control of the Meteorological Service, that is contained therein.

"The President and Council observe that no reference is made to the possible alternatives indicated by the Royal Society in their letter of November 8, 1904, viz., either (i) that some curtailment of parts of the existing routine Service might be included in the scheme of re-organisation: or (ii) that the scientific investigation which is necessary to the progress of the Service might be organised in conjunction with, and with the financial support of, the Government of India. They much regret that, as their Lordships have not found it possible to entertain either of these plans suggested by the Royal Society for obtaining the funds recommended by the late Committee as desirable for improving the efficiency of the Meteorological Service of this country, the connection of the Royal Society with it must terminate, and they will be prepared to give up control on April 1, or as soon thereafter as may be convenient. They would desire to be informed in due course of the steps that should be taken by them to that end.

"As the cessation of any connection between the Meteorological Service and expert scientific opinion will throw the difficult task of devising improvement in the scientific methods of the Service upon the Director, who is to be responsible for the whole executive and administrative control of the office, the President and Council cannot doubt that it is the intention of their Lordships to arrange plans for providing him with some efficient substitute for the expert guidance of the present Council.

"The Royal Society cannot, however, terminate their connection, extending nearly to forty years, with this administration without recording their sense of the high services rendered to the public and to scientific progress by the Meteorological Council. Without the active and single-minded efforts of men such as the late Sir G. G. Stokes, of Cambridge, and the late Prof. H. J. S. Smith, of Oxford, not to mention living members of the Council, the British Service could not have been so efficiently organised, or have served as a model for organising the services of other countries. Such work as theirs does not usually, in the nature of things, attract public attention, and it is known only to a few experts how much the community is indebted to them.

"We are, Sir,
"Your obedient Servants,
J. LARMOR,
ARCHD. GEIKIE.
"Secretaries, R.S.

"The Secretary,
"H.M. Treasury."

1234. *Annual Report.*—It was resolved to proceed with the preparation of the Annual Report on the same lines as last year, and to incorporate as an appendix a summary of the operations of the Office since its establishment in 1854.

1235. *Special Telegraphic Reports for 31st March.*—The Secretary was authorised to arrange for special telegraphic reports of 4 p.m. observations, and to make other necessary special arrangements in connexion with an afternoon reception by the Council on 31st March.

1236. *Fishery Barometers* (Minutes 1072, 1092, 1115, 1178)—*Ireland.*—The Secretary reported that he had had an interview with the Rev. W. S. Green, Chief Inspector of Fisheries for the Irish Board of Agriculture and Technical Instruction and had learned—

i. That Kilkee was a fashionable summer resort for visitors and a barograph might be provided locally if representation were made. (Minute 1072.)

ii. That there was not sufficient reason for the supply of a barometer at the public expense to Kilmacollogue. (Minute 1092.)

iii. That the Irish Board were disposed to co-operate in making experiment with regard to the use of barographs for the more important Fishery Stations, and would probably suggest that the Council should provide the barographs for a few (three) stations, upon the understanding that the Board should make all necessary provision for the care of them and the exhibition of the records and should take over the inspection of the Fishery Barometers in Ireland. That Rosbeg, Co. Donegal, was a suitable station for a barograph and would be one of those selected for the suggested experiment. (Minute 1115.)

It was resolved (i) that a barograph be lent for Rosbeg upon the Board of Agriculture and Technical Instruction making the necessary arrangements; (ii) that a letter be written to Kilkee suggesting that a barograph might be provided locally; (iii) that the application from Kilmacollogue be not complied with.

—— *Worth Matravers.*—Read—M.O. 711 from Sir T. H. Elliott reporting favourably on the application for a barometer for Worth Matravers. (Minute 1178.)

The Secretary was directed to inquire whether the local Fisheries Committee ought not to be expected to bear the expense of the barometer.

1237. *Publications—Marine.*—Read the following memorandum :—

The stock of the following publications being exhausted, the Marine Superintendent wishes a requisition to be sent to the Stationery Office for the supply of the numbers specified which they had in stock on 20th December, 1904 :—

18 Charts of Barometric Pressure over the Atlantic, Indian, and Pacific Oceans (Official No. 76.)
13 Daily Weather Charts of Cyclones in Arabian Sea, June, 1885. (Official No. 80.)
4 Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (Official No. 123.)
11 Charts of the N. Atlantic in the Winter of 1898–99. (Official No. 142.)

The Secretary was directed to report upon the number of copies of various publications presented in return for logs in the course of the past year.

1238. *Paper on the Seasons in the British Isles* (Minutes 1157, 1213).—It was resolved that the tables of Weekly Values and Summaries for the several districts be completed and published as a separate official publication with the text of the paper as an introduction.

1239. *Instruments—Quarterly Returns* :—

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 31st DECEMBER, 1904.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st Oct., 1904	72	106	250	20	23	47
	Received, new	—	—	—	20	—	10
	„ cleaned and repaired.	21	36	11	61	90	—
	Totals	93	142	261	101	113	57
	Issued	36	52	167	19	19	7
	Total available 1st Jan., 1905.	57	90	94	82	94	50

RETURN of ADMIRALTY INSTRUMENTS for the QUARTER ending 31st DECEMBER, 1904.

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.
†Portsmouth	25	23	—	2	55	55	—	—	150	145	—	5	50	60	10	—	50	73	23	—	25	14	—	11
†Devonport	25	21	—	4	55	34	—	21	150	139	—	11	50	50	—	—	50	43	—	7	22	19	—	3
†Chatham	25	24	—	1	55	46	—	9	150	158	8	—	50	47	—	3	50	53	3	—	25	25	—	—
†Sheerness	6	6	—	—	15	7	—	8	30	22	—	8	10	9	—	1	10	9	—	1	10	10	—	—
Queenstown	5	4	—	1	10	7	—	3	15	15	—	—	8	5	—	3	8	7	—	1	—	—	—	—
(Dockyards, Home) Totals	86	78	—	8	190	149	—	41	495	479	8	24	168	171	10	7	168	185	26	9	82	68	—	14
Gibraltar	2	2	—	—	2	7	5	—	4	4	—	—	3	2	—	1	3	3	—	—	—	—	—	—
†Malta	11	10	—	1	15	11	—	4	60	52	—	8	10	10	—	—	10	11	1	—	1	1	—	—
Bombay	4	2	—	2	3	3	—	—	10	7	—	3	4	2	—	2	4	3	—	1	1	2	1	—
*Halifax	3	1	—	2	4	3	—	1	20	16	—	4	4	4	—	—	4	2	—	2	1	—	—	1
*Bermuda	3	1	—	2	4	3	—	1	20	20	—	—	4	4	—	—	4	4	—	—	1	2	1	—
Jamaica	3	1	—	2	2	5	3	—	10	9	—	1	2	3	1	—	2	3	1	—	1	1	—	—
Cape of Good Hope	7	7	—	—	8	10	2	—	33	37	4	—	8	12	4	—	8	10	2	—	2	3	1	—
Trincomali	3	—	—	3	3	1	—	2	10	6	—	4	4	5	1	—	4	3	—	1	1	1	—	—
Hong Kong	17	18	1	—	21	24	3	—	87	40	—	47	21	22	1	—	21	22	1	—	5	2	—	3
†Sydney	5	1	—	4	6	0	—	6	25	0	—	25	6	8	2	—	6	8	2	—	1	—	—	1
Esquimalt	4	—	—	4	5	8	3	—	15	18	3	—	2	2	—	—	2	3	1	—	1	2	1	—
(Dockyards, Abroad) Totals	62	43	1	20	73	75	16	14	294	209	7	92	68	74	9	3	68	72	8	4	15	14	4	5
Grand Totals and Net Shortage at Depôts	148	121	—	**35**	263	224	—	**39**	789	688	—	**101**	236	245	**+9**	—	236	257	**+21**	—	97	82	—	**15**
At Meteorological Office ...	45	**57**	12	—	120	**90**	—	30	250	**94**	—	156	80	**82**	2	—	80	**94**	14	—	50	**50**	—	—
Repairing	—	—	26	—	—	—	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Returnable from Depôts ...	—	—	21	—	—	—	47	—	—	—	12	—	—	—	22	—	—	—	23	—	—	—	—	—
Ordered	—	—	—	—	—	—	—	—	—	—	342	—	—	—	—	—	—	—	—	—	—	—	—	—
Net Surplus or Shortage at M.O.	—	—	+59	—	—	—	+30	—	—	—	+198	—	—	—	+24	—	—	—	+37	—	—	—	—	—
Proposed to be Ordered ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(20)	—

Approved.

* No returns for December quarter have been received. † Supplies have been sent since 31st December, 1904.

NOTE.—No change has occurred in the Stock of Hydrometers.

R. F. WALLACE.

1240. *Logs.*—Fifteen received, one excellent (Captain C. B. Anderssen). One light-house register.

1241. *Storm Warnings* :—

Signals hoisted on 10 days; total number of districts warned, 70.

In 29 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 26 districts by subsequent strong winds (force 7 or 6). In 15 districts they were not required.

1242. *Accounts*—(i.) *Audit.*—Reported—That the cash accounts for the quarter ended the 31st December last had been this day examined by Prof. Darwin and Dr. Buchan and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st October last, when there was a balance of £1,384 6*s.* 2*d.*, were £4,003 16*s.* 7*d.* against £3,909 10*s.* 11*d.* in the corresponding period of the preceding financial year. The payments were £4,584 13*s.* 11*d.* against £4,440 14*s.* 8*d.* during the same period in the previous year. The balance in hand and at the bank on the 31st December, amounted to £803 8*s.* 10*d.*, and at the same date in 1903 to £1,429 9*s.*

—— (ii.)—Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 7th March	3,251	2	5
Receipts from 8th to 21st March	40	13	0
	3,291	15	5
Cheques drawn from 8th to 21st March	279	17	9
Cash balance on 21st March	£3,011	17	8

—— (iii.)—The payment of a bill for £5 7*s.* 6*d.* to Maple and Co., Ltd., for a table was approved.

1243. *Library.*—A list of publications received since the last meeting was laid on the table.

MINUTES OF THE METEOROLOGICAL COUNCIL.

63, Victoria Street, S.W., 5th April, 1905.

PRESENT:

SIR R. STRACHEY IN THE CHAIR.

MR. BUCHAN.	CAPTAIN FIELD, *Hydrographer.*
PROFESSOR DARWIN.	MR. SHAW, *Secretary.*

1244. The Minutes 1232–1243, of the last meeting, March 22nd, was read and confirmed.

1245. *Administration of the Office.* Minute 1233. *Provisional Arrangements.*—The Secretary reported that he had sent to the Treasury an imprest for the payment to the Council of £3,500 on account of the grant for 1905-6 in the usual manner, and had sent with it a letter to Sir G. H. Murray asking to be informed if the Treasury desired any other course to be adopted.

It was resolved that the following letter be addressed to the Treasury and that no action be taken in respect of the administration of the grant for 1905-6, pending a reply.

(M.O. 898.)

Meteorological Office,
63, *Victoria Street, London, S.W.,*
5th April, 1905.

SIR,

AT a meeting of the Meteoro'ogical Council this day, they were informed that a letter from their Secretary, Mr. Shaw, to Sir G. Murray, referring to an application, made in the usual form, for the payment on account of the Meteorological Grant, inquired what course should be followed pending the issue of instructions as to the future organisation of the body to be entrusted with the administration of the Grant.

This inquiry appears to the Meteorological Council to be necessary in consequence of the expression in the letter of the Secretary of the Treasury to the Royal Society, dated 21st January, 1905, to the effect that it was intended that the new arrangements should come into operation from the 1st April, 1905; and, further, that it is observed that in the Estimates for the coming financial year the Grant is proposed to be made to the "Meteorological Office," instead of to the "Meteorological Council," which is the legal designation of the body that has heretofore managed the Meteorological Office.

The Meteorological Council, consequently, request that they may receive early instructions as to the course to be pursued in the management of the Office, until the new authority is constituted.

I am, &c.,
R. STRACHEY,
Chairman of the Meteorological Council.

The Secretary of the Treasury,
The Treasury.

1246. *Climatological information for the Board of Agriculture.*—Read.—M.O. 820 from Major P. G. Craigie, Assistant Secretary of the Board of Agriculture, asking for monthly summaries of climatological returns for Great Britain for 1904 arranged according to the districts adopted by the Board of Agriculture.

The Secretary suggested that it would be desirable to discuss the question of the grouping of Stations for agricultural and sanitary purposes before entering upon the preparation of the returns, and that that view should be represented to the Board of Agriculture.

Approved.

1247. *Observatories, Kew.*—Read.—M.O. 781 from the Director of the National Physical Laboratory calling attention to the amount covered by insurance in respect of apparatus, &c., at Kew, belonging to the Council.

It was agreed that no alteration be made in the amount at the present time.

1248. *Colonial Observations, St. Helena* (Minute 1190).—Read.—M.O. 858 from the Colonial Office in reply to the letter of 10th February.

—— —— *Wei-Hai-Wai.*—Read—M.O. 742 from the Admiralty enclosing meteorological observations for the year 1904.

1249. *Antarctic Observations.*—Read—M.O. 806 from the National Antarctic Expedition stating that the Report on the Natural History Collections to be published by the Trustees of the British Museum would be uniform in size with the Transactions of the Royal Society.

1250. *Daily Weather Report: Presentation Copies.*—The presentation of four copies to the Department of Agriculture and Technical Instruction for Ireland, on the requisition of the Controller of the Stationery Office, was approved; also the presentation of a copy to the Fulham Central Library at the request of the Public Libraries Committee of the Borough.

1251. *Logs.*—Eight received, one excellent—Capt. R. Pattman.

1252. *Storm Warnings:*—

Signals hoisted on 2 days: total number of districts warned, 9.
In 4 districts the warnings were justified by subsequent strong winds (force 7 or 6). In 5 districts they were not required.

25 Wt 8997 7/05 D & S 23 22090 A

1253. *Storm Warning Checking*, 1904.—The Report on the Checking of Storm Warnings for 1904 was submitted.

1254. *Accounts* :—

	£	s.	d.
Cash balance on 21st March	3,011	17	8
Receipts from 22nd March to 4th April	175	4	7
	3,187	2	3
Cheques drawn from 22nd March to 4th April	2,226	9	1
Cash balance on 4th April	£960	13	2

1255. *Reports of Work* for March were submitted and approved.

1256. *Library*.—A list of publications received since last meeting was laid on the table.

EXTRAORDINARY GENERAL MEETING.

63, *Victoria Street, S.W., 12th July*, 1905.

1257. An Extraordinary General Meeting of the Meteorological Council was held at 63, Victoria Street, on Wednesday, 12th July, 1905, at the hour of 2h. 30m. p.m.

The following members were present :—

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN. | CAPTAIN FIELD (*Hydrographer*).

MR. SHAW (*Secretary*).

The Secretary read the notice convening the meeting as follows :—

Meteorological Council.

Meteorological Office,
26th June, 1905.

SIR,

I BEG to inform you that an extraordinary general meeting of the Meteorological Council will be held at the Office on Wednesday the 12th proximo at 2.30 p.m., for the purpose of approving and, if necessary, of executing arrangements for the transfer of the property of the Council to the Meteorological Committee constituted by Treasury Minute dated 20th May, 1905, or their legal representatives.

A copy of the Treasury Minute is enclosed herewith.

I am, &c.,
(Signed) W. N. SHAW,
Secretary.

Read—The following letters :—

I. From the Secretary of the Treasury :—

10,596/05.

Treasury Chambers,
6th June, 1905.

SIR,

THE work of the Meteorological Council having now been taken over by the newly constituted Meteorological Committee, the Lords Commissioners of His Majesty's Treasury are anxious not to let the occasion pass without expressing their regret at the termination of your long connection of over 32 years with the Council and Committee, for over 22 years of which period you were Chairman of the Council, and of signifying their high appreciation of the great services to the Meteorology of this country which your scientific abilities and administrative experience have enabled you to render.

They have no doubt that the work which the Council has carried out under your guidance will prove of the greatest value for the future development of meteorological work in this country.

My Lords desire at the same time to signify through you their thanks to your colleagues on the Meteorological Council for their services.

I am, &c.,

(Signed) G. H. MURRAY.

Lieut.-Gen. Sir R. Strachey, &c.

II. From the Chairman to the Secretary of the Treasury in reply :—

69, Lancaster Gate,
9th June, 1905.

SIR,

I HAVE received with much satisfaction your letter of the 6th inst., conveying to me and my colleagues on the Meteorological Council the thanks of the Lords of the Treasury for our services, and their special recognition of my own participation in the administration of the Meteorological Office.

On behalf of myself and the Council, I desire to add that it would not be doing justice to the staff of the Office with which we have been so long associated if we failed to recognise the excellent manner in which they have performed the duties entrusted to them, and we are gratified by knowing that it has been possible before our connexion with them has terminated to have brought into operation a system of superannuation which was essential to ensure the future satisfactory working of the Meteorological Office.

(Signed) RICHARD STRACHEY.

Sir G. H. Murray, K.C.B.

III. From the Chairman to the President of the Royal Society :—

69, Lancaster Gate,
London, W.
15 April, 1905.

DEAR SIR WILLIAM HUGGINS,

AT the last meeting of the Meteorological Council on the 5th April it was resolved that a letter, a copy of which is annexed, should be addressed by me, as Chairman of the Council, to the Treasury, enquiring, for reasons stated therein, what course should be followed pending the issue of instructions as to the future administration of the Meteorological Grant.

I received no answer from the Treasury, but I have been informed by Mr. W. Shaw, the Secretary of the Council, that he has received from the Treasury authority for the payment of the first instalment of the Government Grant for 1905-6 on account of the "Meteorological Office," thereby intimating that it is not at the disposal of the "Meteorological Council" to which such Grants had previously been made.

At the same time Mr. Shaw has sent me a copy of a letter from the Treasury addressed to him personally, which replies to my letter of the 5th April, requesting him to take entire charge of the Meteorological Office pending the completion of the arrangements for the new managing authority.

In these circumstances the connection of the "Meteorological Council" with the Meteorological Office having ceased, it only remains for it to give effect to whatever steps may be necessary for the legal transfer to the Treasury, or any authority named by it, of the cash and other property now in possession of the "Meteorological Council" in its corporate capacity.

I remain, &c.,

(Signed) RICHARD STRACHEY,
Chairman of the Meteorological Council.

Sir W. Huggins, K.C.B., &c., &c.,
President of the Royal Society.

The following resolution was proposed by the Chairman, seconded by Dr. Buchan, and carried unanimously :—

"The Lords of the Treasury having directed that as from the 1st April, 1905, the Parliamentary Grant for Meteorological purposes shall be administered by a newly constituted Meteorological Committee, it is hereby resolved that the balance of cash and the securities remaining in the possession of the Meteorological Council on that date, and any interest or instalments of annuities accruing thereupon up to the date of the transfer of such securities, together with all other property appertaining to the Meteorological Office then in their charge, shall be transferred to the said newly constituted Meteorological Committee, and that Professor G. Darwin, F.R.S., and Mr. W. N. Shaw, F.R.S., are hereby authorised on behalf of the Meteorological Council to take all such action as shall be necessary for giving effect to this resolution."

The meeting then adjourned.

73RD MEETING OF DIRECTORS.

63, *Victoria Street, 12th July*, 1905.

PRESENT:

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN. | CAPTAIN FIELD (*Hydrographer*).

MR. SHAW (*Secretary*).

1258. *Annual Report.*—A proof of the introductory portion of the Annual Report was submitted and approved.

1259. *Accounts.*—Submitted—The following Statement of Accounts for the year ending 31st March, 1905 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1903–1904	—	1,489 12 7	Administration :		
Parliamentary vote ...	—	15,300 0 0	Council	839 5 0	
Repayment of expenses charged under—			Secretary	625 0 0	
(1.) Incidental expenses	26 5 11		Salaries and wages ...	1,086 17 6	
(2.) Observatories ...	38 8 6		Rent, fuel, and lighting	723 13 1	
(3.) Special researches	29 5 0		Incidental and contingent expenses ...	445 12 0	
(4.) Antarctic Meteorology	100 0 0		Furniture, fittings, &c.	153 9 3	
		193 19 5	Expenses incidental to International Meteorological Congress...	29 0 8	
			Special Researches :		3,902 17 6
Supply of Information :			Salaries and other charges	—	886 19 5
Weather Forecasts, Reports, &c. ...	541 18 0		Land Meteorology :		
Telegrams sent abroad	599 2 9		Observatories and stations, including remuneration of observers	2,165 9 9	
		1,141 0 9	Salaries :— Discussion and reduction of observations, &c. ...	1,951 0 0	
			Weather Information and Forecasts :		4,116 9 9
Supply of Instruments, &c. :			Telegraphic reports and storm warnings, remuneration of observers, &c.	2,584 18 9	
Repayment of cost of M.O. instruments purchased by observers	198 18 9		Salaries:—Preparation and issue of reports and forecasts ...	1,341 1 2	
Repayment of cost of other commissions...	331 12 8				3,925 19 11
		530 11 5	Inspections :		
			Salaries and travelling expenses	—	432 2 6
Charges for Commission :			Ocean Meteorology :		
On supply of instruments, &c.	—	28 11 9	Salaries :— Discussion and reduction of observations... ...	1,398 10 6	
			Expenses incidental to the supply of instruments :—		
Superannuation Account :			Proportion of salaries for care and issue of instruments ...	170 0 0	
Annuities	285 6 4		Royal Navy ...	562 1 11	
Interest on Investment	46 6 5		Mercantile Marine and Stations ...	605 15 6	
		331 12 9			2,736 7 11
			Antarctic Meteorology :		
			Salaries and other charges	—	148 1 4
			Miscellaneous Commissions executed for Colonial and Foreign institutions, &c.	—	277 2 5
			Superannuation :		
			Pensions and allowances...	829 3 2	
			Invested	750 0 0	
					1,579 3 2
			Balance :		
			Cash at Bank... ...	957 9 3	
			„ at Office ...	52 15 6	
					1,010 4 9
		£19,015 8 8			£19,015 8 8

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors (partly estimated)	801 16 4	By cash at Bank and at Office ...	1,010 4 9
„ balance	605 6 4	„ sundry debtors	396 17 11
	£1,407 2 8		£1,407 2 8

Note.—On March 31st the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £2,156 4s. 1d.

1260. *Accounts: Audit.*—Reported—That the cash accounts for the quarter ended the 31st March last had been this day examined by the Chairman and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st January last, when there was a balance of £803 8*s.* 10*d.*, were £5,474 16*s.* 10*d.* against £5,289 2*s* 3*d.* in the corresponding period of the preceding financial year. The payments were £5,268 0*s.* 11*d.* against £5,228 18*s.* 8*d.* during the same period in the previous year. The balance in hand and at the bank on the 31st March amounted to £1,010 4*s.* 9*d.*, and at the same date in 1904 to £1,489 12*s.* 7*d.*

1261. *Corporate Seal.*—Resolved—With reference to the resolution adopted at the Extraordinary General Meeting of this date (Minute 1257), the Directors hereby authorise Professor G. H. Darwin and Mr. W. N. Shaw to affix the Seal of the Council to any power of attorney or other instrument required to give effect to the said resolution.